



TEST REPORT

Product Name: Mini PC
Trademark: N/A
Model Number: B4 Turbo, For other models, see section P4.1
Prepared For: Creature Information(Guangzhou)Technology Co., Limited
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Manufacturer: Creature Information(Guangzhou)Technology Co., Limited
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Sample Received Date: Mar. 17, 2025
Sample tested Date: Mar. 17, 2025 to Apr. 07, 2025
Issue Date: Apr. 07, 2025
Report No.: CTB25031709702RF05
Test Standards ETSI EN 302 502V2.1.1 (2017-03)
Test Results PASS
Remark: This is 5.8G radio test report.
Compiled by: Reviewed by: Approved by:

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Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

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(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB25031709702RF05	Apr. 07, 2025	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Standard	EN 302 502 V2.1.3	
Test Item	Test Requirement	Results
Designation of Centre Frequencies and frequency error	Clause 4.2.1	PASS
Transmitter RF Output Power, EIRP and EIRP Spectral Density	Clause 4.2.2	PASS
Transmitter unwanted emissions	Clause 4.2.3	PASS
Transmitter Power Control	Clause 4.2.4	PASS
Dynamic Frequency Selection(DFS)	Clause 4.2.6	PASS
Receiver Spurious Emissions	Clause 4.2.5	PASS
Receiver Blocking	Clause 4.2.7	PASS
User Access Restrictions	Clause 4.2.8	PASS
<p>Remark:</p> <p>Note: N/A is an abbreviation for Not Applicable and means this test item is not applicable for this device according to the technology characteristic of device.</p> <p>Tx: In this whole report Tx (or tx) means Transmitter.</p> <p>Rx: In this whole report Rx (or rx) means Receiver.</p> <p>RF: In this whole report RF means Radiated Frequency.</p> <p>CH: In this whole report CH means channel.</p>		

Note : The two series model rf modules are the same, so only the stray part is tested for difference, the two rf models are DCT1ER2611 and WXT2IM2511

3. MEASUREMENT UNCERTAINTY

Where relevant, the measurement uncertainty figures shall be calculated and shall correspond to an expansion factor (coverage factor) $k = 1,96$ or $k = 2$ (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)). Principles for the calculation of measurement uncertainty are contained in ETSI TR 100 028 [i.4], in particular in annex D of the ETSI TR 100 028-2 [i.4].

Item	Uncertainty
Occupancy bandwidth	54.3kHz
Conducted output power Above 1G	0.9dB
Conducted output power below 1G	0.9dB
Power Spectral Density , Conduction	0.9dB
Conduction spurious emissions	2.0dB
Out of band emission	2.0dB
3m camber Radiated spurious emission(30MHz-1GHz)	4.6dB
3m chamber Radiated spurious emission(1GHz-18GHz)	5.1dB
3m chamber Radiated spurious emission(18GHz-40GHz)	3.4dB
Receiver Reference Sensitivity level	1.9dB
humidity uncertainty	5.5%
Temperature uncertainty	0.63 °C
frequency	1×10^{-7}

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	B4 Turbo, MP01, MP02, MP03, MP05, B1, B1 A, B1 G, B1 J, B1 S, B1 Plus, B1 Pro, B1 Power, B1 Turbo, B1 Ultra, B1 Mini, B2, B2 A, B2 G, B2 J, B2 S, B2 Plus, B2 Pro, B2 Power, B2 Turbo, B2 Ultra, B2 Mini, B2N, B2N S, B2N Plus, B2N Pro, B2N Power, B2N Ultra, B3, B3 A, B3 G, B3 J, B3 S, B3 Plus, B3 Pro, B3 Power, B3 Turbo, B3 Ultra, B3 Mini, B3N, B3N S, B3N Plus, B3N Pro, B3N Power, B3N Ultra, B4, B4 A, B4 G, B4 J, B4 S, B4 Plus, B4 Pro, B4 Power, B4 Turbo, B4 Ultra, B4 Mini, B4A, B4A Plus, B4A Pro, B4A Power, B4A Turbo, B4A Ultra, B5, B5 A, B5 G, B5 J, B5 S, B5 Plus, B5 Pro, B5 Power, B5 Turbo, B5 Ultra, B5A, B5A Plus, B5A Pro, B5A Power, B5A Turbo, B5A Ultra, B6, B6 A, B6 G, B6 J, B6 S, B6 Plus, B6 Pro, B6 Power, B6 Turbo, B6 Ultra, B6A, B6A Plus, B6A Pro, B6A Power, B6A Turbo, B6A Ultra, B7, B7 A, B7 G, B7 J, B7 S, B7 Plus, B7 Pro, B7 Power, B7 Turbo, B7 Ultra, B7A, B7A Plus, B7A Pro, B7A Power, B7A Turbo, B7A Ultra, B8, B8 A, B8 G, B8 J, B8 S, B8 Plus, B8 Pro, B8 Power, B8 Turbo, B8 Ultra, B8A, B8A Plus, B8A Pro, B8A Power, B8A Turbo, B8A Ultra, B9, B9 A, B9 AI, B9 G, B9 J, B9 S, B9 Plus, B9 Pro, B9 Power, B9 Turbo, B9 Ultra, B9A, B9A AI, B9A Plus, B9A Pro, B9A Power, B9A Turbo, B9A Ultra, B10, B10 A, B10 AI, B10 G, B10 J, B10 S, B10 Plus, B10 Pro, B10 Power, B10 Turbo, B10 Ultra, B10A, B10A AI, B10A Plus, B10A Pro, B10A Power, B10A Turbo, B10A Ultra, B11, B11 A, B11 AI, B11 G, B11 J, B11 S, B11 Plus, B11 Pro, B11 Power, B11 Turbo, B11 Ultra, B11A, B11A AI, B11A Plus, B11A Pro, B11A Power, B11A Turbo, B11A Ultra, B12, B12 A, B12 AI, B12 G, B12 J, B12 S, B12 Plus, B12 Pro, B12 Power, B12 Turbo, B12 Ultra, B12A, B12A AI, B12A Plus, B12A Pro, B12A Power, B12A Turbo, B12A Ultra, B13, B13 A, B13 AI, B13 G, B13 J, B13 S, B13 Plus, B13 Pro, B13 Power, B13 Turbo, B13 Ultra, B13A, B13A AI, B13A Plus, B13A Pro, B13A Power, B13A Turbo, B13A Ultra, B14, B14 A, B14 AI, B14 G, B14 J, B14 S, B14 Plus, B14 Pro, B14 Power, B14 Turbo, B14 Ultra, B14A, B14A AI, B14A Plus, B14A Pro, B14A Power, B14A Turbo, B14A Ultra, B15, B15 A, B15 AI, B15 G, B15 J, B15 S, B15 Plus, B15 Pro, B15 Power, B15 Turbo, B15 Ultra, B15A, B15A AI, B15A Plus, B15A Pro, B15A Power, B15A Turbo, B15A Ultra, M1U, M1U Plus, M1U Pro, M1U Power, M1U Turbo, M1U Ultra, M2U, M2U Plus, M2U Pro, M2U Power, M2U Turbo, M2U Ultra, M3U, M3U Plus, M3U Pro, M3U Power, M3U Turbo, M3U Ultra, M4U, M4U Plus, M4U Pro, M4U Power, M4U Turbo, M4U Ultra, M5U, M5U Plus, M5U Pro, M5U Power, M5U Turbo, M5U Ultra, M6U, M6U Plus, M6U Pro, M6U Power, M6U Turbo, M6U Ultra
Model Description:	All the model are the same circuit and RF module, only the model name and appearance are different. Test sample model: B4 Turbo
WIFI Version:	IEEE 802.11a/b/g/n/ac
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	IEEE 802.11a/n/ac(20M): 5725MHz ~5850MHz/ 5 channel IEEE 802.11n/ac(40M): 5725MHz ~5850MHz/ 2 channel IEEE 802.11ac(80M): 5725MHz ~5850MHz/ 1 channel
Max. RF output power:	WiFi(5G):13.52dBm
Type of Modulation:	WiFi: DSSS, OFDM
Antenna installation:	Internal antenna

Antenna Gain: WiFi(5G) ANT1:1.0dBi, ANT2:1.0dBi

Ratings:

For AC/DC ADAPTER: 100-240V~, 50/60Hz, 1.0A Max.
For Mini PC: 12V --- 2.0A

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1.	Keyboard	DELL	KB216t	N/A	AE
2.	Mouse	DELL	MS116c	N/A	AE
3.	Monitor	DELL	SE2218HV	N/A	AE
4.	Router	Huawei	AX2 Pro	/	AE

Notes:

- All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

For 802.11a/n/ac(20M) Operation in the 5725MHz ~5850 MHz band			
Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz	NA	NA

For 802.11n/ac(40M) Operation in the 5725MHz ~5850 MHz band			
Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

For 802.11ac(80M) Operation in the 5725MHz ~5850 MHz band			
Channel	Frequency	Channel	Frequency
155	5775MHz	NA	NA

4.5 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
802.11a/n/ac(20M)	5725MHz ~5850 MHz	Channel 149	Channel 157	Channel 165
		5745MHz	5785MHz	5825MHz
802.11n/ac(40M)	5725MHz ~5850 MHz	Channel 151	N/A	Channel 159
		5755MHz	N/A	5795MHz
802.11ac(80M)	5725MHz ~5850 MHz	N/A	Channel 155	N/A
		N/A	5775MHz	N/A

4.6 Test Environment

Humidity(%):	54
Atmospheric Pressure(kPa):	101
Normal Voltage(AC)(V):	230
Low Voltage(AC)(V):	207
High Voltage(AC)(V):	253
Normal Temperature(°C) :	23
Low Temperature(°C) :	-20
High Temperature(°C) :	55

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at 1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

RF conduction and Radiation Test equipment

No.	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	A.14.16	2025/6/28
2	Power Sensor	Agilent	U2021XA	MY56120032	/	2025/6/28
3	Power Sensor	Agilent	U2021XA	MY56120034	/	2025/6/28
4	Communication test set	R&S	CMW500	108058	V3.5.80	2025/6/28
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	A.14.16	2025/6/28
6	Signal Generator	Agilent	N5181A	MY50140365	A.01.60	2025/6/28
7	Vector signal generator	Agilent	N5182A	MY47420195	A.01.87	2025/6/28
8	Communication test set	Agilent	E5515C	MY50102567	B.19.07 (E1962B)	2025/6/28
9	2.4 GHz Filter	Shenxiang	MSF2400-24 83.5MS-1154	20181015001	/	2025/6/30
10	5 GHz Filter	Shenxiang	MSF5150-58 50MS-1155	20181015001	/	2025/6/30
11	Filter	Xingbo	XBLBQ-DZA 120	190821-1-1	/	2025/6/30
12	BT&WI-FI Automatic test software	Microwave	MTS8310	Ver. 2.0.0.0	/	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	/	2025/6/28
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	/	2025/6/28
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	/	/
16	966 chamber	C.R.T.	966	/	/	2027/6/21
17	Receiver	R&S	ESPI	100362	RF_ATTEN_7 (104489/003)	2025/6/28
18	Amplifier	HP	8447E	2945A02747	/	2025/6/28
19	Amplifier	Agilent	8449B	3008A01838	/	2025/6/28
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	/	2025/6/28
21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	/	2025/6/28

22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	/	2025/6/28
24	loop antenna	ZHINAN	ZN30900A	GTS534	/	/
25	40G Horn antenna	A/H/System	SAS-574	588	/	2025/6/28
26	Amplifier	AEROFLEX	Aeroflex	097	/	2025/6/28
27	Power Metter	KEYSIGHT	N1912AP	N/A	A.05.00	2025/6/28

6. DESIGNATION OF CENTRE FREQUENCIES AND FREQUENCY ERROR

6.1 Test Configuration

The frequencies at which the conformance requirements in clause 4.2.1 shall be verified are defined in clause 5.3.2.

The UUT shall be set to operate at a normal RF power output level.

For a UUT with antenna connector(s) and using external antenna(s), or for a UUT with integral antenna(s) but with a temporary antenna connector provided, conducted measurements shall be used.

For a UUT with integral antenna(s) and without a temporary antenna connector, radiated measurements shall be used.

6.2 Limit

The actual centre frequency for any given channel declared by the manufacturer shall be maintained within the range $f_c \pm 20$ ppm.

6.3 Test procedure

Equipment operating without modulation:

This test method requires that the UUT can be operated in an unmodulated test mode.

The UUT shall be connected to a frequency counter and operated in an unmodulated mode. The actual carrier centre frequency shall be recorded and shall be compared to the nominal channel centre frequency.

Equipment operating with modulation:

This method is an alternative to the above method in case the UUT can not be operated in an un-modulated mode.

The UUT shall be connected to spectrum analyser.

The settings of the spectrum analyser shall be adjusted to optimize the instrument's frequency accuracy.

Max Hold shall be selected and the centre frequency adjusted to that of the UUT.

The peak value of the power envelope shall be measured and noted. The span shall be reduced and the marker moved in a positive frequency increment until the upper, (relative to the centre frequency), -10 dBc point is reached. This value shall be noted as f_1 .

The marker shall then be moved in a negative frequency increment until the lower, (relative to the centre frequency), -10 dBc point is reached. This value shall be noted as f_2 .

The actual carrier centre frequency is calculated as $(f_1 + f_2) / 2$ and shall be compared to the nominal channel centre frequency.

6.4 Test Result

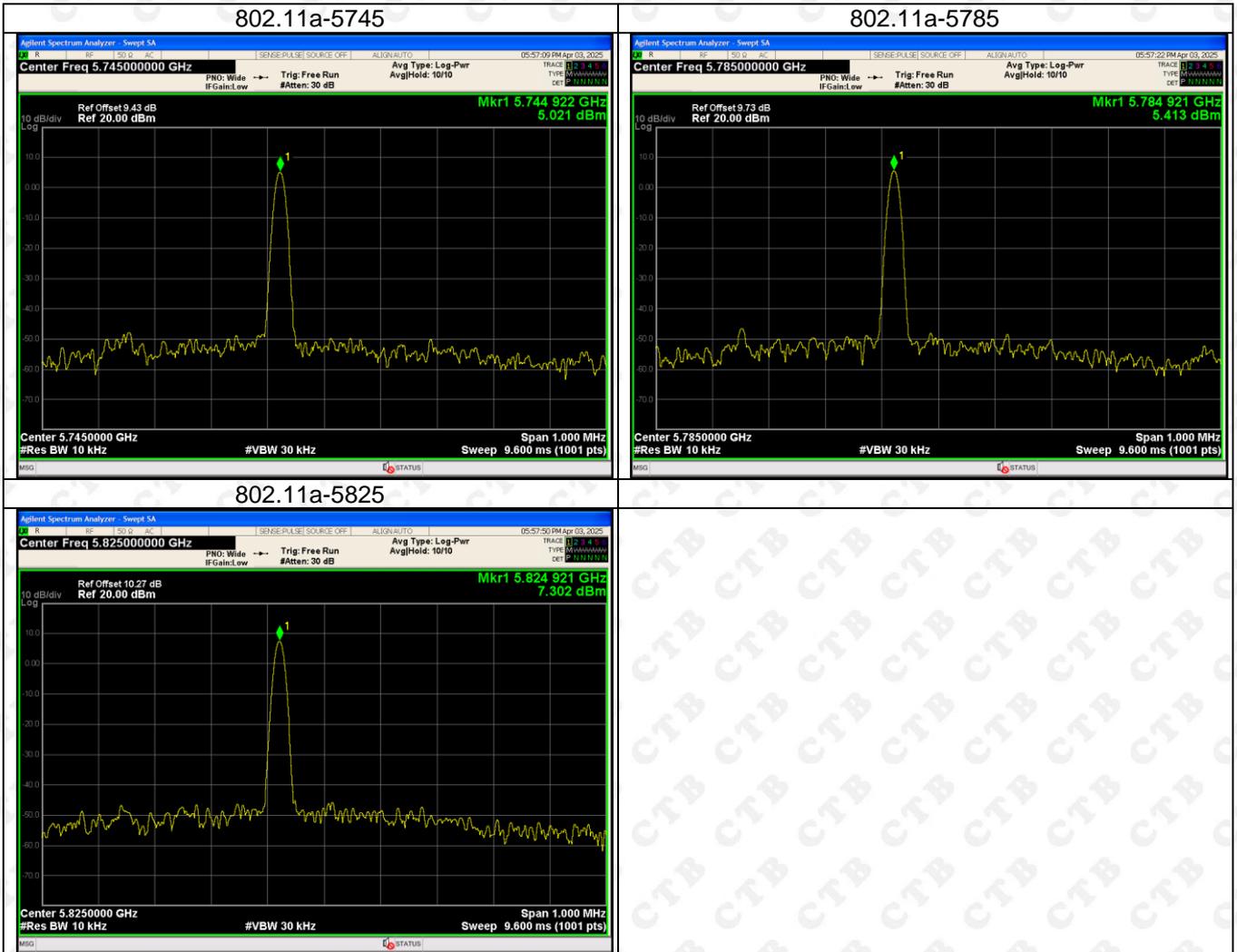
 ANT1:
 802.11a

Modulation	Channel (MHz)	Measured Frequency (MHz)	Deviation (ppm)	Limit (ppm)	Verdict
NVNT	LCH	5744.922	-13.577	20	Pass
	MCH	5784.921	-13.656	20	Pass
	HCH	5824.921	-13.562	20	Pass
HTLV	LCH	5744.914	-15.047	20	Pass
	MCH	5784.917	-14.400	20	Pass
	HCH	5824.912	-15.074	20	Pass
HTHV	LCH	5744.921	-13.762	20	Pass
	MCH	5784.912	-15.250	20	Pass
	HCH	5824.911	-15.211	20	Pass
LTHV	LCH	5744.913	-15.198	20	Pass
	MCH	5784.914	-14.915	20	Pass
	HCH	5824.913	-14.982	20	Pass
LTLV	LCH	5744.918	-14.249	20	Pass
	MCH	5784.912	-15.188	20	Pass
	HCH	5824.918	-14.142	20	Pass

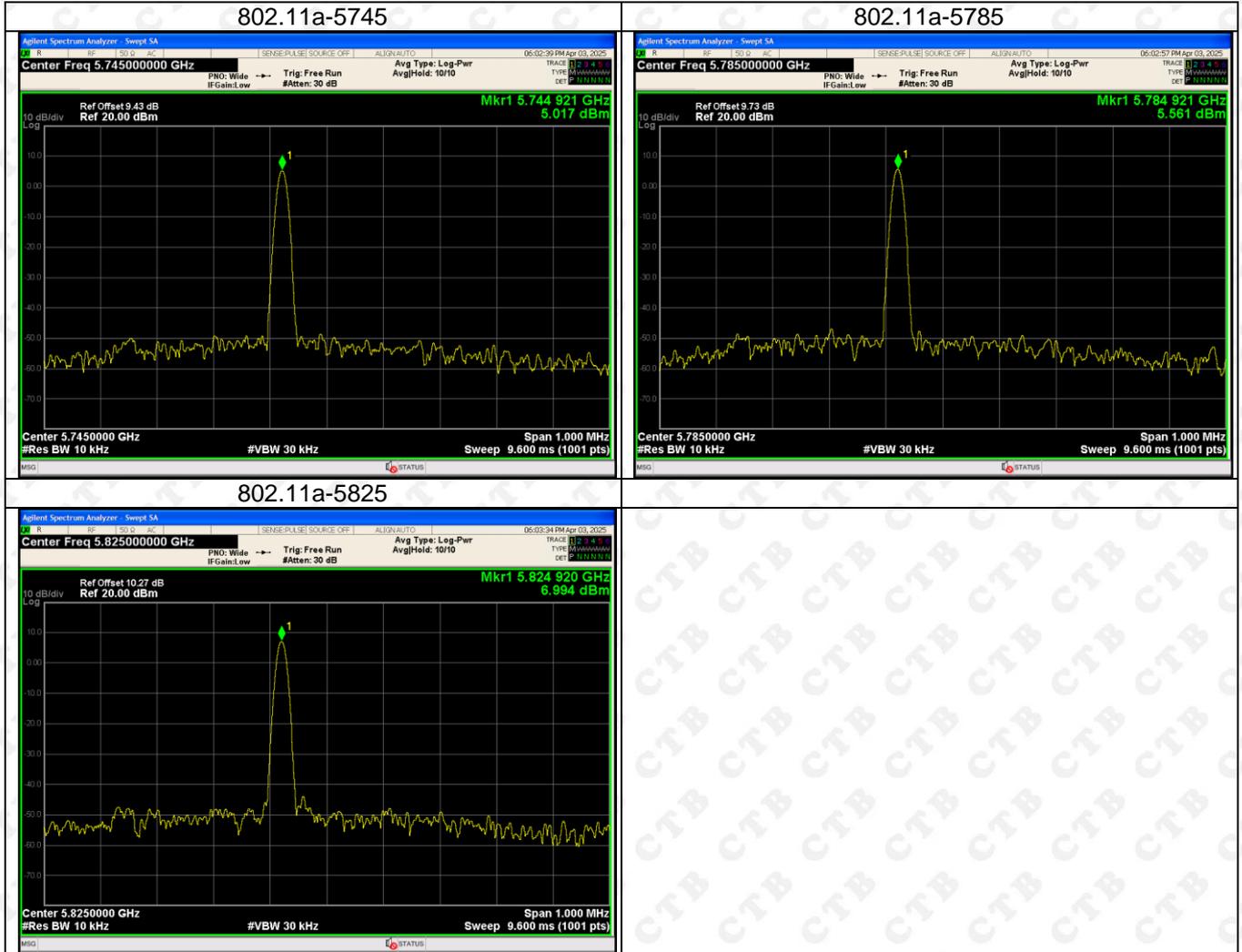
ANT2:

Modulation	Channel (MHz)	Measured Frequency (MHz)	Deviation (ppm)	Limit (ppm)	Verdict
NVNT	LCH	5744.921	-13.751	20	Pass
	MCH	5784.921	-13.656	20	Pass
	HCH	5824.92	-13.734	20	Pass
HTLV	LCH	5744.919	-14.108	20	Pass
	MCH	5784.917	-14.386	20	Pass
	HCH	5824.918	-14.003	20	Pass
HTHV	LCH	5744.915	-14.709	20	Pass
	MCH	5784.918	-14.089	20	Pass
	HCH	5824.918	-14.025	20	Pass
LTHV	LCH	5744.920	-13.937	20	Pass
	MCH	5784.919	-13.971	20	Pass
	HCH	5824.916	-14.356	20	Pass
LTLV	LCH	5744.913	-15.133	20	Pass
	MCH	5784.918	-14.196	20	Pass
	HCH	5824.916	-14.469	20	Pass

ANT1:



ANT2:



7. TRANSMITTER RF OUTPUT POWER AND EIRP

7.1 Test Configuration

The conformance requirements in clause 4.2.2 shall be verified at those carrier centre frequencies defined in clause 5.3.2. The measurements shall be performed using normal operation of the equipment with test signal applied (see clause 5.3.1.1).

Special test functions may be needed in the UUT to make this test possible.

For a UUT with antenna connector(s) and using external antenna(s), or for a UUT with integral antenna(s) but with a temporary antenna connector provided, conducted measurements shall be used in conjunction with the stated antenna assembly gain(s).

For a UUT with integral antenna(s) and without a temporary antenna connector, radiated measurements shall be used.

7.2 Limit

Channel Width(MHz) ChS	Mean RF power into antenna (dBm)	Mean EIRP(dBm)
10	27	33
20	30	36

7.3 Test procedure

Step 1:

The equipment shall be configured to operate with the P_{cond_1} .

Step 2:

- a) using suitable attenuators, the output power of the transmitter shall be coupled to a matched diode detector or equivalent thereof. The output of the diode detector shall be connected to the vertical channel of an oscilloscope;
- b) the combination of the diode detector and the oscilloscope shall be capable of faithfully reproducing the duty cycle of the transmitter output signal;
- c) the observed duty cycle of the transmitter (Tx on/(Tx on + Tx off)) shall be noted as x ($0 < x \leq 1$), and recorded in the test report. For the purpose of testing, the equipment shall be operated with a duty cycle that is equal to or greater than 0,1 (see clause 5.1.2.1).

Step 3:

- a) the RF output power of the transmitter shall be determined using a wideband calibrated RF power meter with a matched thermocouple detector or an equivalent thereof and with an integration period that exceeds the repetition period of the transmitter by a factor 5 or more. The observed value shall be noted as "A" (in dBm);
- b) calculate $P_{cond} = A + 10 \log(1/x)$ (dBm) where x is the observed duty cycle;
- c) the EIRP shall be calculated from the above measured power output P_{cond} (in dBm) using the antenna assembly gain G according to the formula $P_{EIRP} = P_{cond} + G$ (dBm). If more than one antenna assembly is intended for this power setting, the gain of the antenna assembly with the highest gain shall be used. If no specific antenna assemblies have been declared, the declared maximum usable antenna gain for this power setting shall be used;
- d) P_{cond} and P_{EIRP} shall be recorded in the test report and shall be compared to the relevant limits.

Step 4:

- a) if the equipment has only one TPC range, Step 4 should be skipped;
- b) the equipment shall be configured to operate with the conducted power setting P_{cond_2}
- c) Steps 2 to 3 shall be repeated.

Step 5:

- a) the equipment shall be configured to operate with the conducted power setting P_{cond_3} ;
- b) Steps 2 and 3 shall be repeated.

Step 6:

- a) if the configurations described in Step 1 and Step 4b) do not cover the configuration resulting in the overall highest EIRP for the FWA device, Step 2 and 3 shall be repeated for the configuration resulting in the highest EIRP.

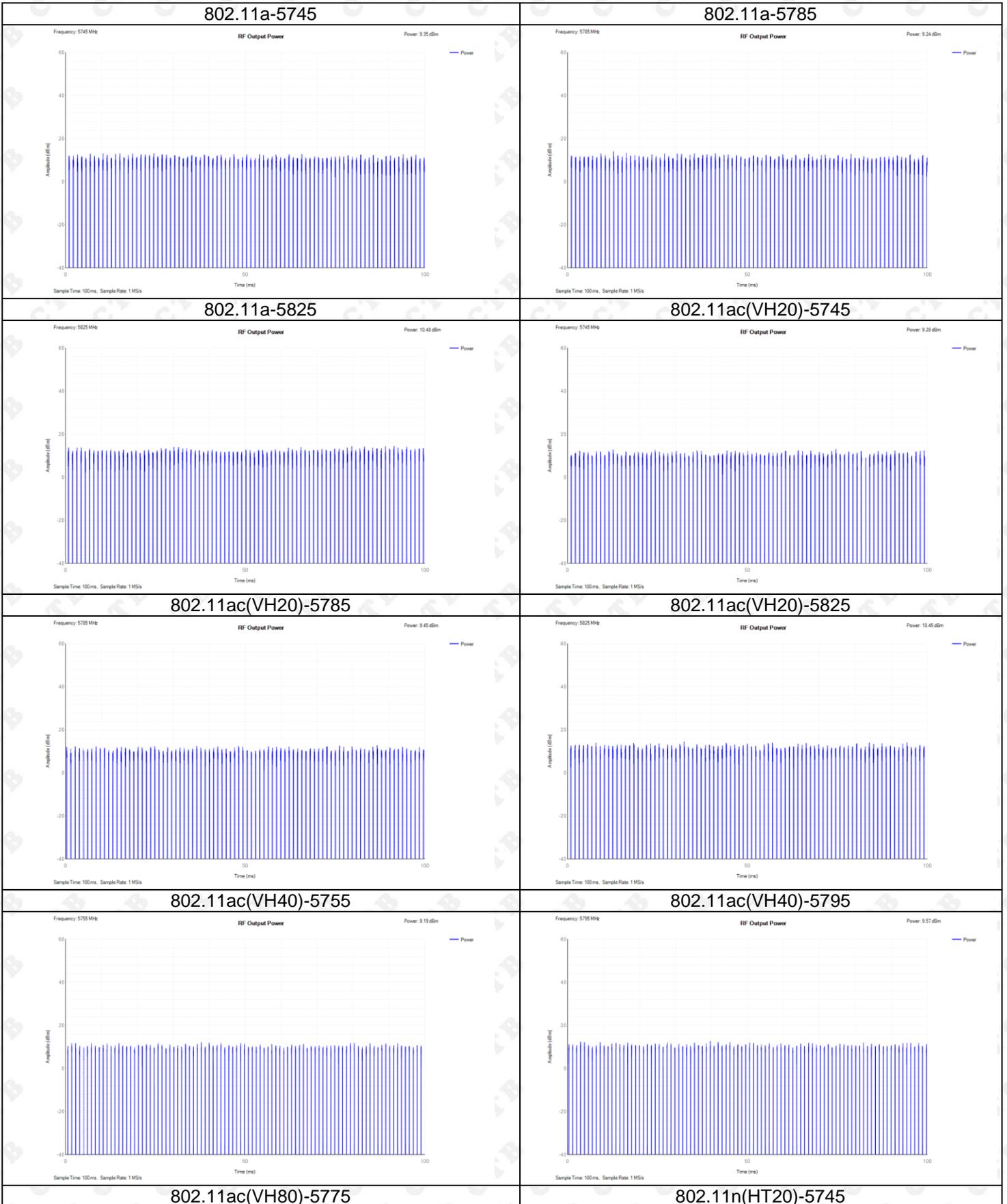
7.4 Test Result

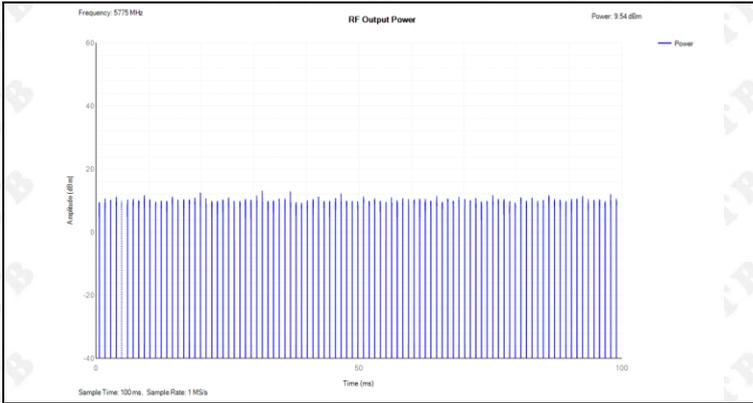
ANT1+ANT2:

Modulation	Test conditions (Temperature)	Antenna	Low Channel		Middle Channel		High Channel		
			EIRP	Total EIRP	EIRP	Total EIRP	EIRP	Total EIRP	
802.11a	NVNT	ANT1	9.35	/	9.24	/	10.48	/	
		ANT2	9.11		9.45		10.35		
	LVLТ	ANT1	9.05	/	9.01	/	10.44	/	
		ANT2	8.72		9.08		10.44		
	LVHT	ANT1	9.26	/	9.25	/	10.43	/	
		ANT2	9.17		9.06		10.28		
	HVLТ	ANT1	9.07	/	9.19	/	10.39	/	
		ANT2	9.02		9.17		9.99		
	HVHT	ANT1	9.39	/	9.28	/	10.48	/	
		ANT2	8.68		9.50		9.95		
	802.11(ac20)	NVNT	ANT1	9.28	12.40	9.45	12.60	10.45	13.52
			ANT2	9.49		9.72		10.57	
LVLТ		ANT1	9.20	12.31	9.40	12.55	10.36	13.40	
		ANT2	9.39		9.68		10.43		
LVHT		ANT1	9.01	12.24	9.38	12.55	10.33	13.42	
		ANT2	9.43		9.69		10.49		
HVLТ		ANT1	9.21	12.27	9.23	12.46	10.18	13.33	
		ANT2	9.30		9.65		10.47		
HVHT		ANT1	9.22	12.27	9.42	12.50	10.31	13.39	
		ANT2	9.31		9.56		10.45		
802.11(ac40)	NVNT	ANT1	9.19	12.13	/	/	9.57	12.76	
		ANT2	9.04				9.92		
	LVLТ	ANT1	9.15	12.09	/	/	9.50	12.71	
		ANT2	9.00				9.89		
	LVHT	ANT1	9.18	12.05	/	/	9.49	12.70	
		ANT2	8.89				9.89		
	HVLТ	ANT1	9.19	12.09	/	/	9.50	12.67	
		ANT2	8.97				9.82		
	HVHT	ANT1	8.97	12.01	/	/	9.57	12.70	
		ANT2	9.03				9.81		
802.11(ac80)	NVNT	ANT1	9.54	12.75	/	/	/	/	
		ANT2	9.94				/		
	LVLТ	ANT1	9.44	12.64	/	/	/	/	
		ANT2	9.81				/		
	LVHT	ANT1	9.36	12.63	/	/	/	/	
		ANT2	9.87				/		
	HVLТ	ANT1	9.38	12.60	/	/	/	/	
		ANT2	9.79				/		
	HVHT	ANT1	9.49	12.59	/	/	/	/	
		ANT2	9.67				/		
802.11(n20)	NVNT	ANT1	9.26	12.30	9.19	12.38	10.39	13.40	
		ANT2	9.31		9.54		10.38		
	LVLТ	ANT1	9.12	12.13	9.09	12.23	10.19	13.21	
		ANT2	9.11		9.35		10.20		
	LVHT	ANT1	9.16	12.18	9.01	12.22	10.31	13.32	
		ANT2	9.17		9.40		10.32		
	HVLТ	ANT1	9.17	12.17	8.97	12.20	10.36	13.34	
		ANT2	9.15		9.40		10.30		
	HVHT	ANT1	9.08	12.09	8.97	12.15	10.23	13.30	
		ANT2	9.09		9.29		10.34		

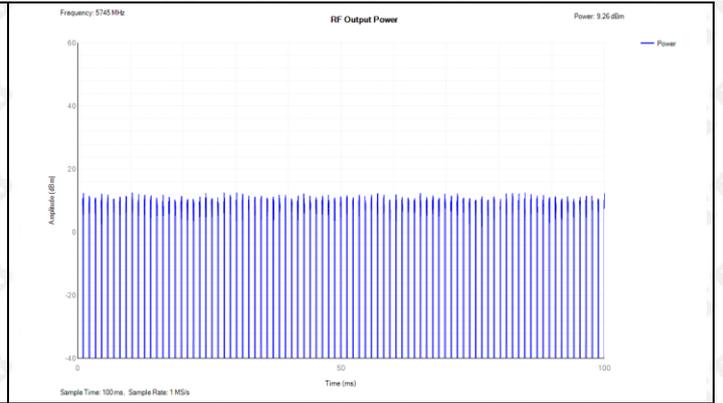
802.11(n40)	NVNT	ANT1	9.38	12.24	/	/	9.68	12.83	
		ANT2	9.07				9.95		
	LVLT	ANT1	9.15	12.05	/	/	9.51	12.68	
		ANT2	8.92				9.83		
	LVHT	ANT1	9.16	12.12	/	/	9.63	12.75	
		ANT2	9.05				9.84		
	HVLT	ANT1	9.17	12.02	/	/	9.42	12.70	
		ANT2	8.85				9.94		
	HVHT	ANT1	9.34	12.10	/	/	9.57	12.70	
		ANT2	8.81				9.81		
	Limit		≤36dBm						

ANT1:

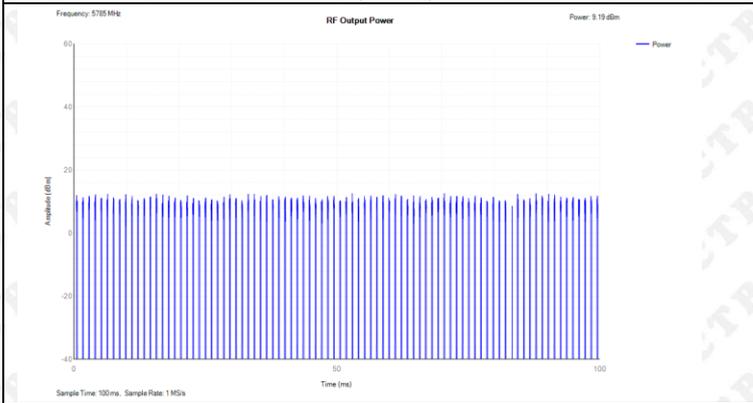




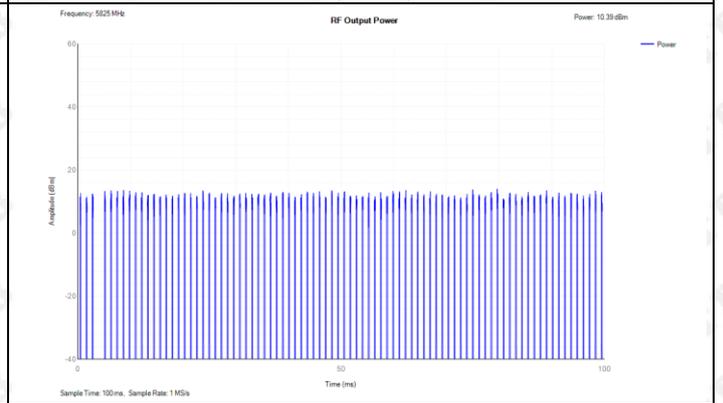
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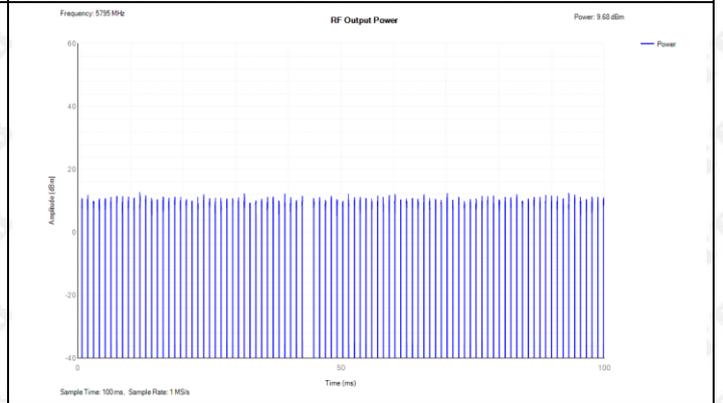
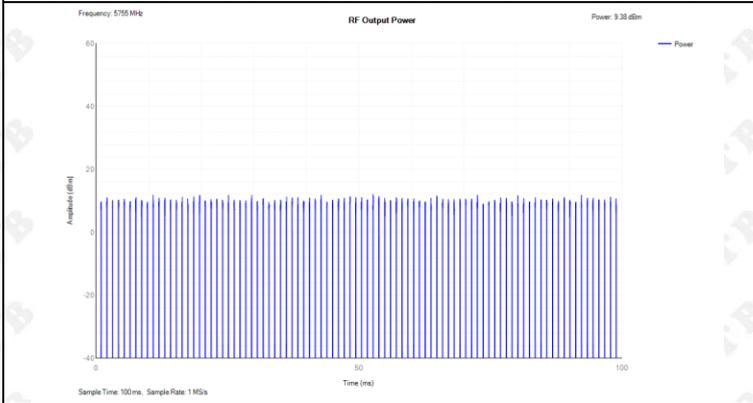
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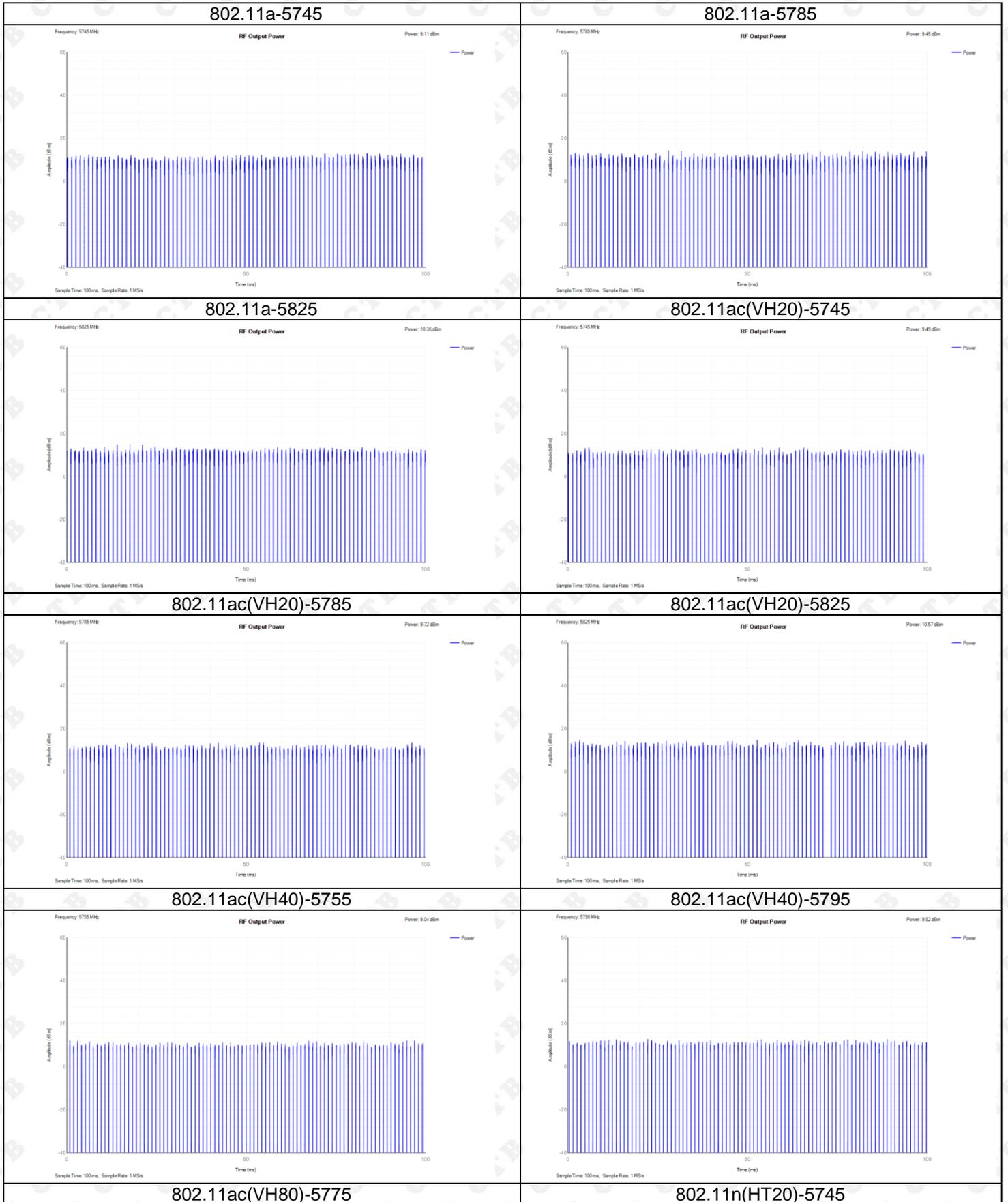
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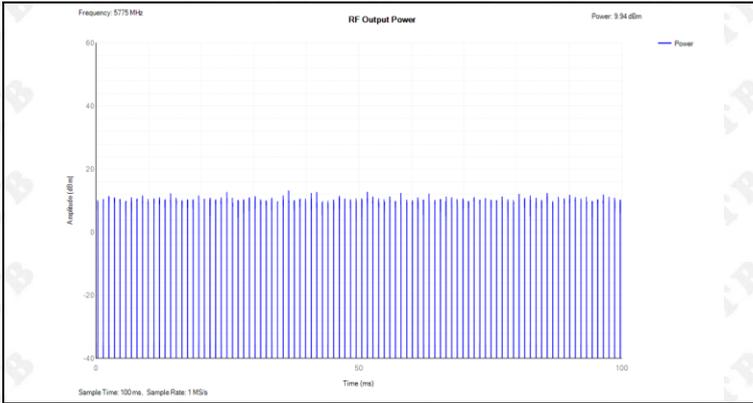


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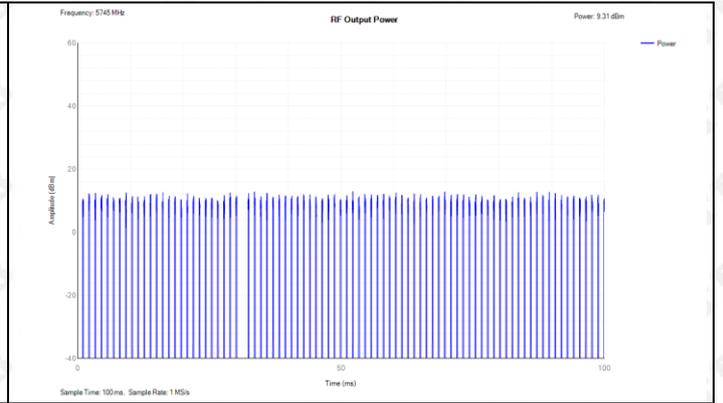


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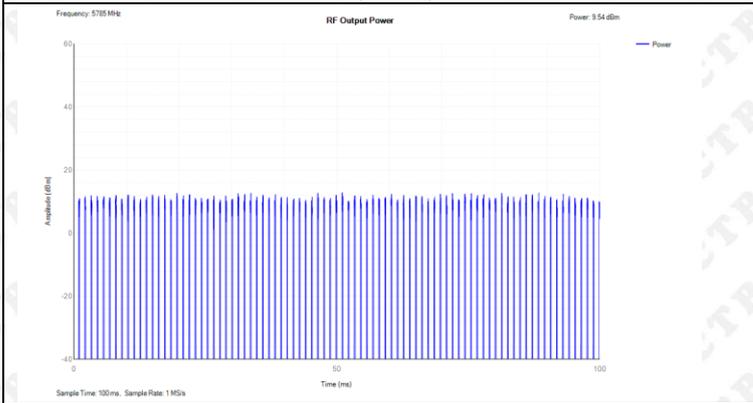




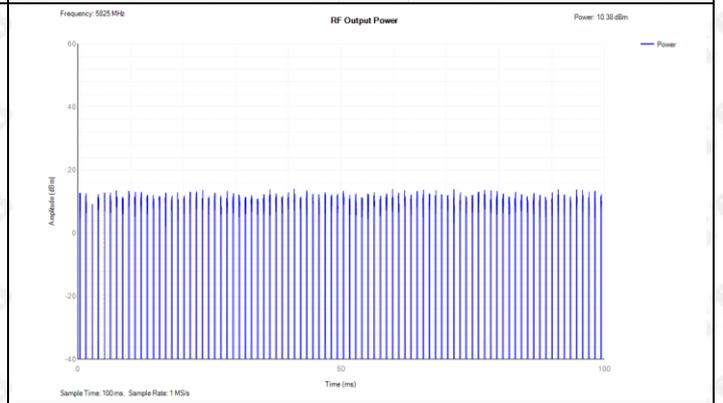
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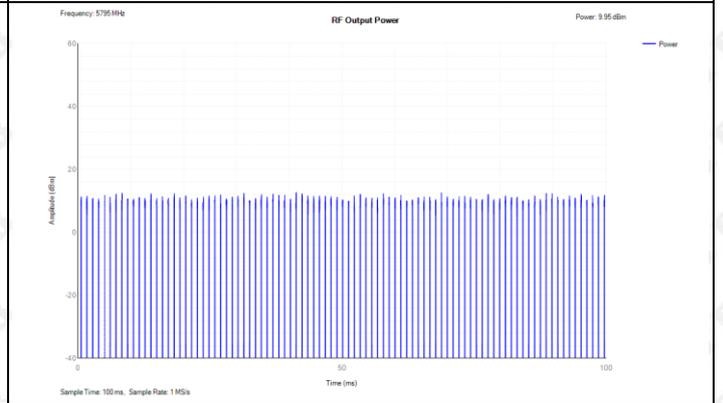
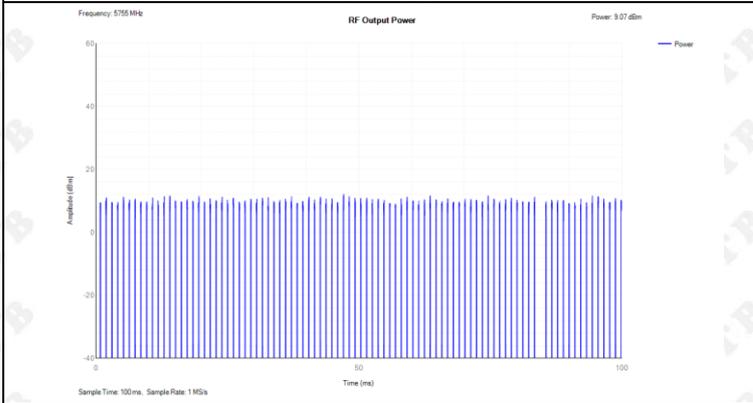
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802.11n(VH40)-5755



802.11n(VH40)-5795



8. EIRP SPECTRAL DENSITY

8.1 Test Configuration

The EIRP spectral density is the mean EIRP evaluated within a specified measurement bandwidth during a transmission burst.

8.2 Limit

Channel Width(MHz) ChS	Mean EIRP spectral density (dBm/MHz)
10	23
20	23

8.3 Test procedure

The UUT shall be operated as described in clause 5.4.3.2.1.1 step 1 although any intermediate power setting associated with a specific antenna assembly gain resulting in operation at the maximum EIRP can be used. Furthermore, for the purpose of this test, the minimum transmitter on-time should be 10 μ s.

In the case of radiated measurements, using a test site as described in annex B and applicable measurement procedures as described in annex C, the power density as defined in clause 4.2.2 shall be measured and recorded.

In case of conducted measurements, the transmitter shall be connected to the measuring equipment via a suitable attenuator and the power density as defined in clause 4.2.2 shall be measured and recorded.

The power density shall be determined using a spectrum analyser of adequate bandwidth in combination with an RF power meter.

Connect an RF power meter to the narrow IF output of the spectrum analyser and correct its reading using a known reference source, e.g. a signal generator.

The IF output of the spectrum analyser may be 20 dB or more below the input level of the spectrum analyser. Unless the power meter has adequate sensitivity, a wideband amplifier may be required.

The test procedure shall be as follows:

Step 1:

- the measurement set-up shall be calibrated with a CW signal from a calibrated source; the reference signal shall be set to a level equal to the value for the applicable limit for EIRP power density (reduced by the highest applicable antenna gain) and at a frequency equal to the centre frequency of the channel being tested;
- the settings of the spectrum analyser shall be:
 - centre Frequency: equal to the signal source;
 - resolution BW: 1 MHz;
 - video BW: 1 MHz;
 - detector mode: positive peak;
 - averaging: off;
 - span: zero Hz;
 - reference level: equal to the level of the reference signal.

Step 2:

- the calibrating signal power shall be reduced by 10 dB and it shall be verified that the power meter reading also reduces by 10 dB.

Step 3:

- connect the UUT. Using the following settings of the spectrum analyser in combination with "max hold" function, find the frequency of highest power output in the power envelope:
 - centre Frequency: equal to operating frequency;
 - resolution BW: no change to the setting in Step 1;

- video BW: no change to the setting in Step 1;
- detector mode: no change to the setting in Step 1;
- averaging: no change to the setting in Step 1;
- span: 1,5 times ChS;
- reference level: no change to the setting in Step 1.
- the frequency found shall be recorded;
- the centre frequency of the spectrum analyser shall be set to the recorded frequency, the span shall be further reduced to 1 MHz and the frequency of the highest power output shall be found. If this frequency is different from the previous recorded frequency, the new frequency shall be recorded.

Step 4:

- set the centre frequency of the spectrum analyser to the found frequency and switch to zero span. The power meter indicates the measured Power Density (D). The mean Power Density EIRP (PD) is calculated from the above measured power density (D), the observed duty cycle x (see clause 5.3.3.2.1.1 Step 1), and the applicable antenna assembly gain "G" in dBi, according to the formula below. If more than one antenna assembly is intended for this power setting or TPC range, the gain of the antenna assembly with the highest gain shall be used:

- $PD = D + G + 10 \log(1/x)$;
- PD shall be recorded in the test report.

The above procedure shall be repeated for each of the frequencies identified in clause 5.1.3.

Where the spectrum analyser bandwidth is non-Gaussian, a suitable correction factor shall be determined and applied.

Where a spectrum analyser is equipped with a facility to measure power density, this facility may be used instead of the above procedure to measure the power density across the occupied channel bandwidth.

8.4 Test Result

ANT1+ANT2:

Modulation	Test conditions (Temperature)	Antenna	Low Channel		Middle Channel		High Channel	
			Power Density	Total	Power Density	Total	Power Density	Total
802.11a	NVNT	Ant1	-11.082	/	-11.847	/	-10.079	/
		Ant2	-12.313		-11.797		-10.692	
802.11(ac 20)	NVNT	Ant1	-12.801	-9.78	-12.569	-9.41	-11.081	-7.97
		Ant2	-12.784		-12.275		-10.882	
802.11(ac 40)	NVNT	Ant1	-17.823	-14.81	/	/	-17.483	-14.34
		Ant2	-18.074		-17.226			
802.11(ac 80)	NVNT	Ant1	-19.812	-16.59	/	/	/	/
		Ant2	-19.398					
802.11(n 20)	NVNT	Ant1	-12.96	-9.95	-12.208	-9.13	-11.058	-8.09
		Ant2	-12.642		-12.068		-11.149	
802.11(n 40)	NVNT	Ant1	-17.42	-14.62	/	/	-17.013	-13.90
		Ant2	-17.841		-16.804			
Limit			≤23dBm/MHz)					

ANT1:

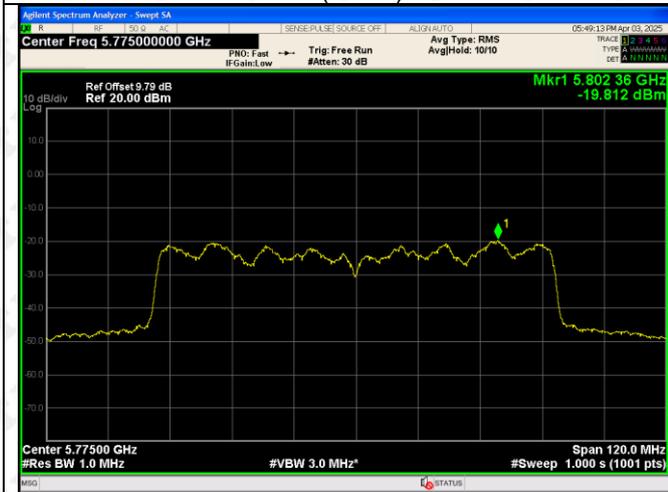




802.11ac(VH80)-5775



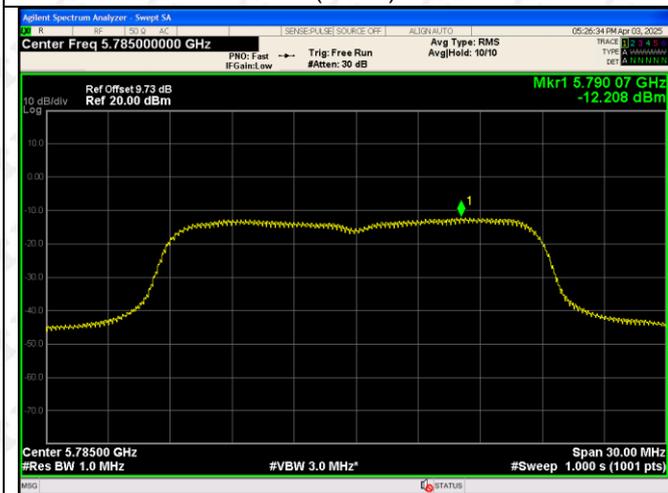
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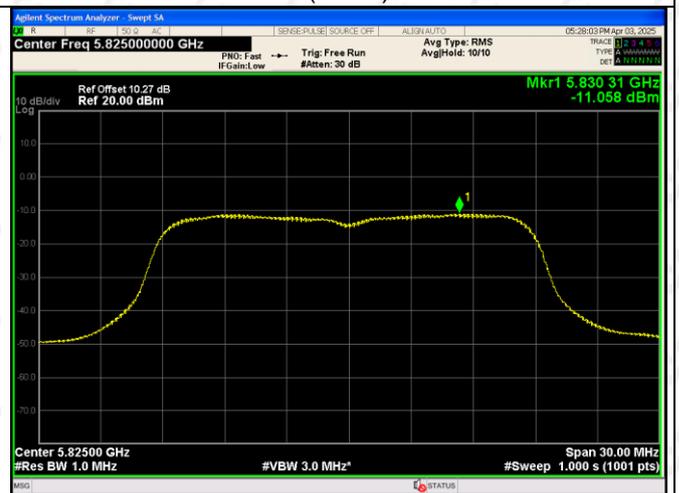
802.11n(HT20)-5785



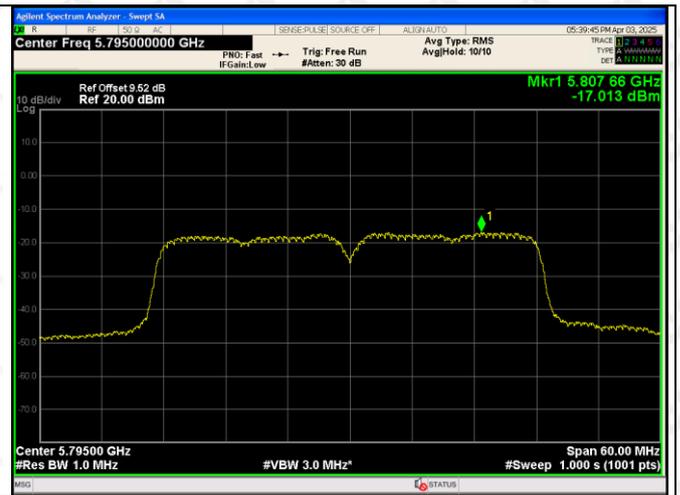
802.11n(HT20)-5825



802.11n(VH40)-5755

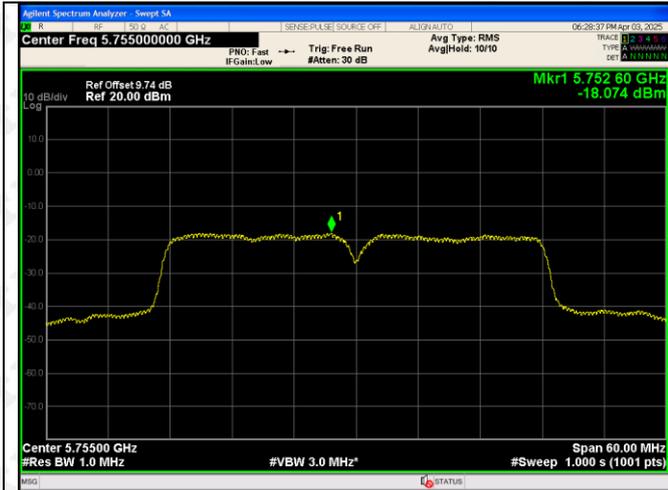


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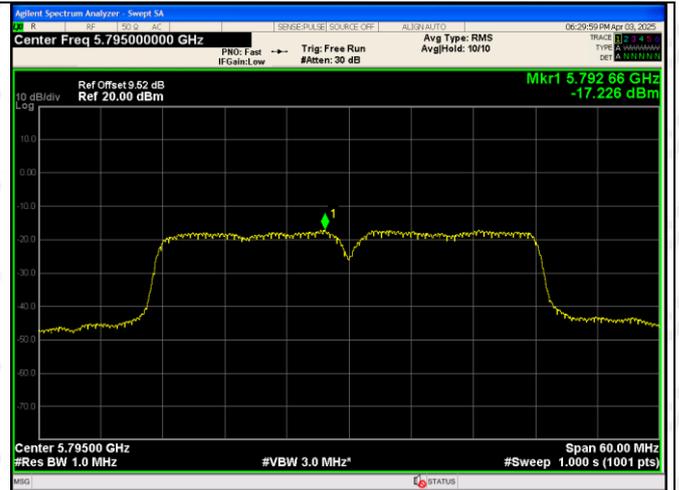


ANT2:





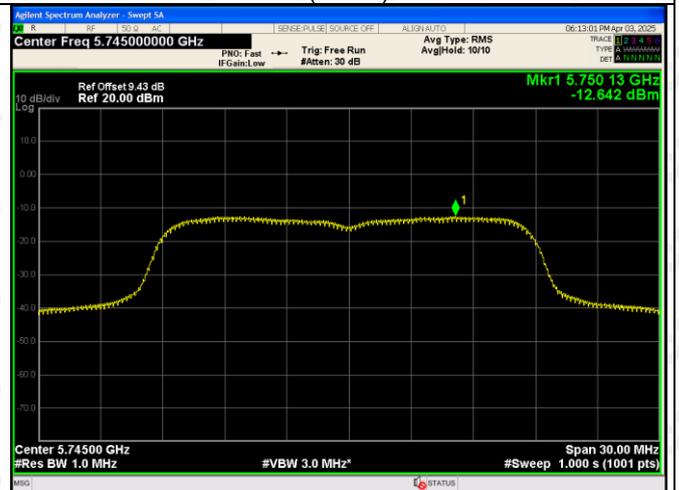
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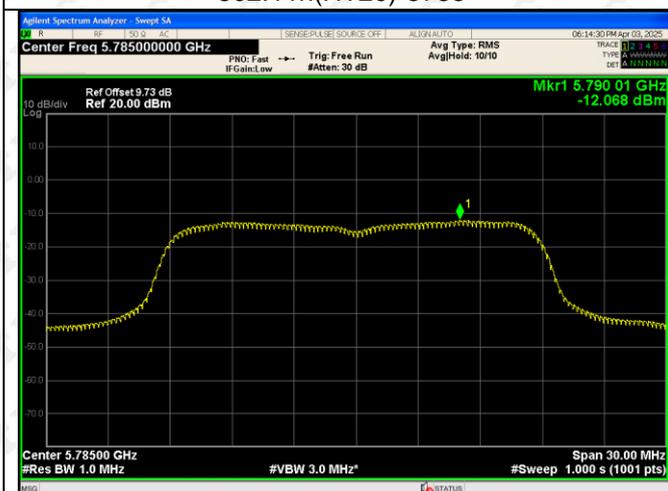
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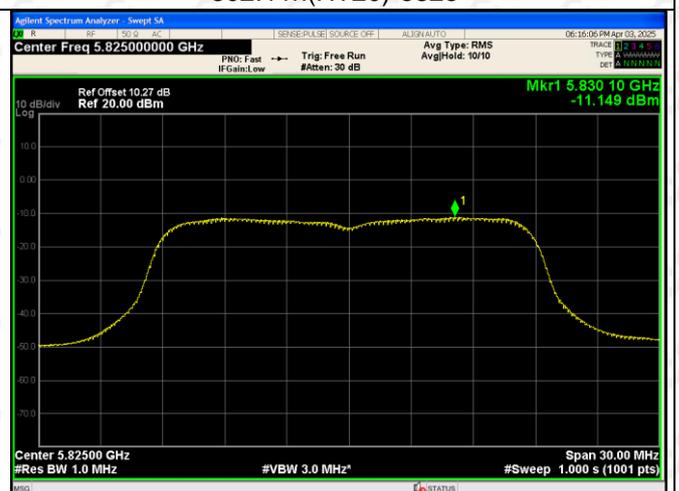
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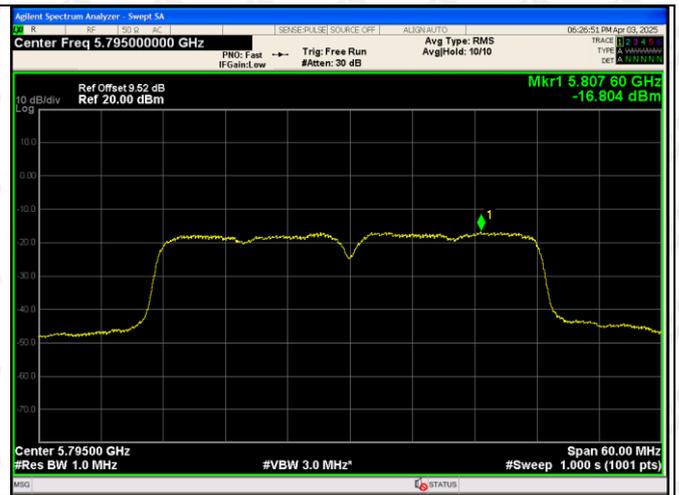
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802.11n(VH40)-5755



802.11n(VH40)-5795



9. TRANSMITTER UNWANTED EMISSIONS OUTSIDE THE 5725MHZ TO 5875MHZ BADNS

9.1 Test Configuration

The conformance requirements in clause 4.2.3.1 shall be verified under normal operating conditions, and at those carrier centre frequencies defined in clause 5.3.2. The UUT shall be configured to operate at P_{cond_1} .

For UUT without an integral antenna and for a UUT with an integral antenna but with a temporary antenna connector, one of the following options shall be used:

- the level of unwanted emissions shall be measured as their power in a specified load (conducted spurious emissions) and their effective radiated power when radiated by the cabinet or structure of the equipment with the antenna connector terminated by a specified load (cabinet radiation); or
- the level of unwanted emissions shall be measured as their effective radiated power when radiated by cabinet and antenna.

In the case where the UUT has an integral antenna, but no temporary antenna connector, only radiated measurements shall be used.

9.2 Limits

The level of unwanted emission shall not exceed the limits given in following table.

Frequency range (MHz)	Limit (dBm)	Bandwidth (kHz) (see note)
30 to 1 000	-36	100
1 000 to 5 725	-30	1000
5 875 to 26 500	-30	1000

NOTE: At frequencies just below 5 725 MHz or just above 5 875 MHz, account shall be taken of the spacing between the emission centre frequency and the measurement centre frequency to evaluate the appropriate reference bandwidth given in annex 2 of CEPT/ERC Recommendation 74-01 [10].

9.3 Test Procedure

The UUT shall be connected to a spectrum analyser capable of RF power measurements. The test procedure shall be as follows:

a) the settings of the spectrum analyser shall be as follows:

- sensitivity: at least 6 dB below the limit given in table 2;
- video bandwidth: 1 MHz;
- video averaging on, or peak hold.

The video signal of the spectrum analyser shall be "gated" such that the spectrum measured shall be measured between 4,0 μ s before the start of the burst to 4,0 μ s after the end of the burst.

NOTE: The "start of the burst" is the centre of the first sample of the preamble heading the burst. The "end of the burst" is the centre of the last sample in the burst.

This gating may be analogue or numerical, dependent upon the design of the spectrum analyser.

b) initially the power level shall be measured in the ranges:

- 30 MHz to 1 GHz; with a resolution bandwidth of 1 MHz and in a frequency scan mode.

c) if any measurement in d) is greater than -36 dBm, then measurements shall be taken with a resolution bandwidth of 100 kHz, zero frequency scan, at the 11 frequencies spaced 100 kHz apart in a band $\pm 0,5$ MHz centred on the failing frequency;

EXAMPLE: A UUT fails at 285 MHz. Measurements are made in a 100 kHz bandwidth on 284,5 MHz, 284,6 MHz, 284,7 MHz, etc. up to 285,5 MHz.

d) the power level shall be measured in the ranges:

- 1 GHz to 5,725 GHz;
- 5,875 GHz to 26,5 GHz.

with a resolution bandwidth of 1 MHz and in a frequency scan mode.

9.4 Test Results

ANT1:

Modulation	Channel (MHz)	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm)	Limit (dBm)	Verdict
802.11a	LCH	30-1000	760.41	-55.345	-36	Pass
		1000-5725	5725	-32.895	-30	Pass
		5875-26500	26170	-40.071	-30	Pass
	MCH	30-1000	760.41	-56.148	-36	Pass
		1000-5725	5172.175	-44.203	-30	Pass
		5875-26500	24973.75	-39.705	-30	Pass
	HCH	30-1000	762.35	-56.705	-36	Pass
		1000-5725	5186.35	-43.853	-30	Pass
		5875-26500	26128.75	-39.163	-30	Pass
802.11(ac20)	LCH	30-1000	763.32	-57.674	-36	Pass
		1000-5725	5725	-32.94	-30	Pass
		5875-26500	26108.125	-39.938	-30	Pass
	MCH	30-1000	191.99	-58.19	-36	Pass
		1000-5725	2521.45	-43.242	-30	Pass
		5875-26500	24973.75	-39.757	-30	Pass
	HCH	30-1000	191.99	-57.497	-36	Pass
		1000-5725	2682.1	-43.886	-30	Pass
		5875-26500	24994.375	-39.147	-30	Pass
802.11(ac40)	LCH	30-1000	762.35	-57.603	-36	Pass
		1000-5725	2667.925	-43.849	-30	Pass
		5875-26500	26500	-39.605	-30	Pass
	HCH	30-1000	191.99	-57.749	-36	Pass
		1000-5725	2663.2	-44.843	-30	Pass
		5875-26500	26108.125	-39.92	-30	Pass
802.11(ac80)	HCH	30-1000	761.38	-54.475	-36	Pass
		1000-5725	5720.275	-34.482	-30	Pass
		5875-26500	25015	-39.35	-30	Pass
802.11(n20)	LCH	30-1000	760.41	-56.151	-36	Pass
		1000-5725	5725	-34.753	-30	Pass
		5875-26500	24994.375	-39.987	-30	Pass
	MCH	30-1000	760.41	-56.344	-36	Pass
		1000-5725	2649.025	-44.892	-30	Pass
		5875-26500	24994.375	-39.612	-30	Pass
	HCH	30-1000	191.99	-57.268	-36	Pass
		1000-5725	2601.775	-44.236	-30	Pass
		5875-26500	26108.125	-39.278	-30	Pass
	LCH	30-1000	760.41	-57.103	-36	Pass
		1000-5725	5720.275	-31.966	-30	Pass
		5875-26500	25695.625	-39.612	-30	Pass

802.11(n40)	HCH	30-1000	759.44	-56.514	-36	Pass
		1000-5725	2686.825	-44.357	-30	Pass
		5875-26500	25386.25	-39.839	-30	Pass

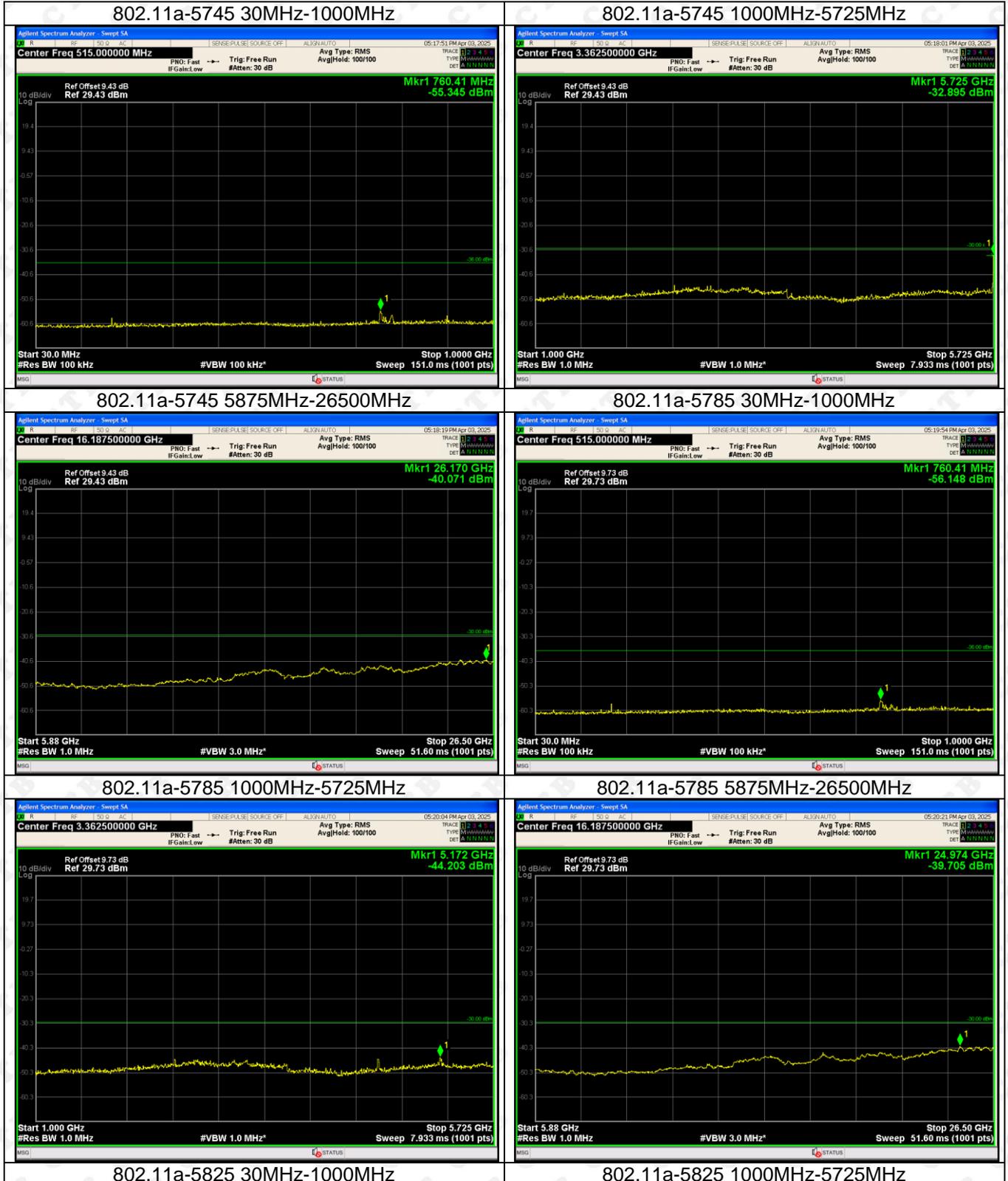
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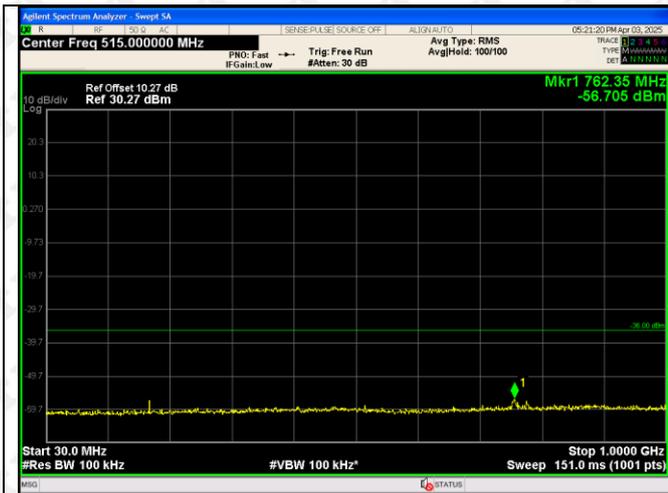
Modulation	Channel (MHz)	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm)	Limit (dBm)	Verdict
802.11a	LCH	30-1000	763.32	-57.009	-36	Pass
		1000-5725	5725	-35.081	-30	Pass
		5875-26500	25736.875	-39.662	-30	Pass
	MCH	30-1000	760.41	-57.574	-36	Pass
		1000-5725	2526.175	-44.437	-30	Pass
		5875-26500	25716.25	-39.582	-30	Pass
	HCH	30-1000	901.06	-45.083	-36	Pass
		1000-5725	2436.4	-42.445	-30	Pass
		5875-26500	25736.875	-39.159	-30	Pass
802.11(ac20)	LCH	30-1000	760.41	-56.634	-36	Pass
		1000-5725	2441.125	-45.391	-30	Pass
		5875-26500	24994.375	-39.756	-30	Pass
	MCH	30-1000	764.29	-58.009	-36	Pass
		1000-5725	3178.225	-45.148	-30	Pass
		5875-26500	25056.25	-39.54	-30	Pass
	HCH	30-1000	759.44	-56.491	-36	Pass
		1000-5725	2686.825	-44.558	-30	Pass
		5875-26500	26108.125	-38.823	-30	Pass
802.11(ac40)	LCH	30-1000	761.38	-56.083	-36	Pass
		1000-5725	5725	-31.697	-30	Pass
		5875-26500	25736.875	-39.517	-30	Pass
	HCH	30-1000	760.41	-56.188	-36	Pass
		1000-5725	2682.1	-45.296	-30	Pass
		5875-26500	26108.125	-39.448	-30	Pass
802.11(ac80)	HCH	30-1000	901.06	-44.091	-36	Pass
		1000-5725	5720.275	-33.776	-30	Pass
		5875-26500	25015	-39.567	-30	Pass
802.11(n20)	LCH	30-1000	759.44	-57.846	-36	Pass
		1000-5725	5725	-32.37	-30	Pass
		5875-26500	26190.625	-40.035	-30	Pass
	MCH	30-1000	760.41	-56.267	-36	Pass
		1000-5725	2436.4	-44.232	-30	Pass
		5875-26500	24994.375	-39.637	-30	Pass
	HCH	30-1000	191.99	-57.692	-36	Pass
		1000-5725	2686.825	-44.252	-30	Pass
		5875-26500	26066.875	-38.727	-30	Pass
802.11(n40)	LCH	30-1000	786.6	-56.138	-36	Pass
		1000-5725	5725	-31.302	-30	Pass
		5875-26500	26108.125	-39.535	-30	Pass
	HCH	30-1000	760.41	-57.507	-36	Pass
		1000-5725	3130.975	-45.141	-30	Pass



	HCH	5875-26500	26108.125	-39.763	-30	Pass
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ANT1:





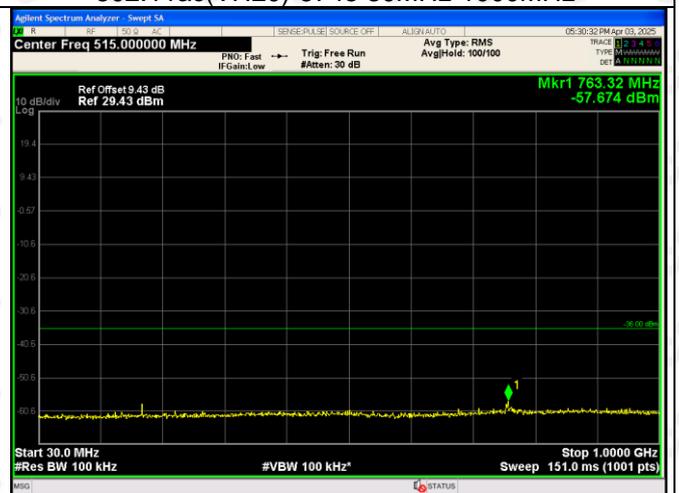
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802.11ac(VH20)-5745 30MHz-1000MHz



802.11ac(VH20)-5745 1000MHz-5725MHz



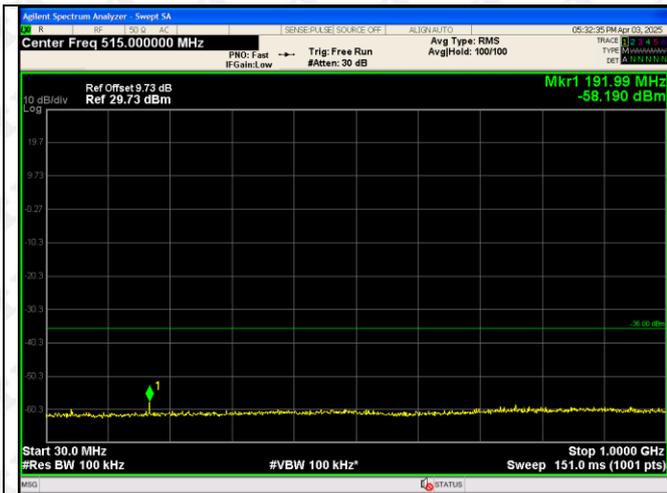
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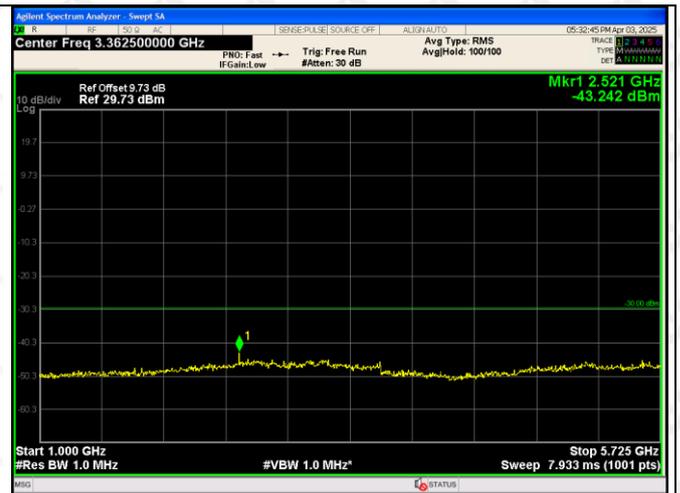
802.11ac(VH20)-5785 30MHz-1000MHz



802.11ac(VH20)-5785 1000MHz-5725MHz



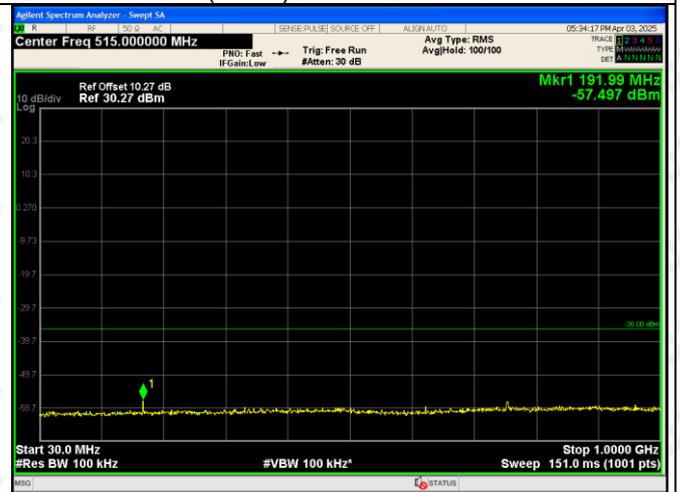
802.11ac(VH20)-5785 5875MHz-26500MHz



802.11ac(VH20)-5825 30MHz-1000MHz



802.11ac(VH20)-5825 1000MHz-5725MHz



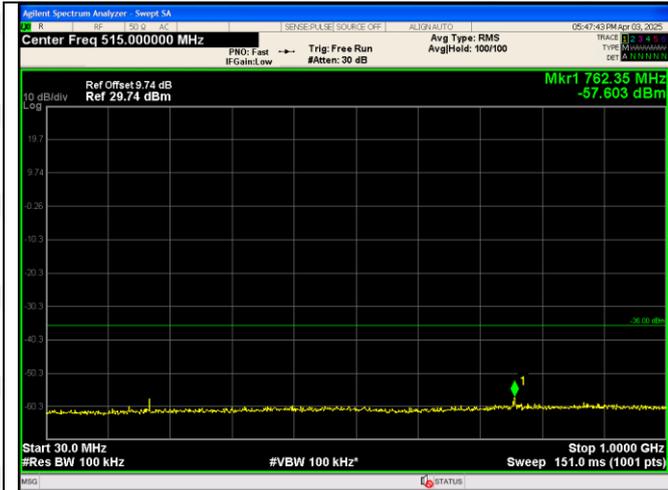
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802.11ac(VH40)-5745 30MHz-1000MHz



802.11ac(VH40)-5755 1000MHz-5725MHz



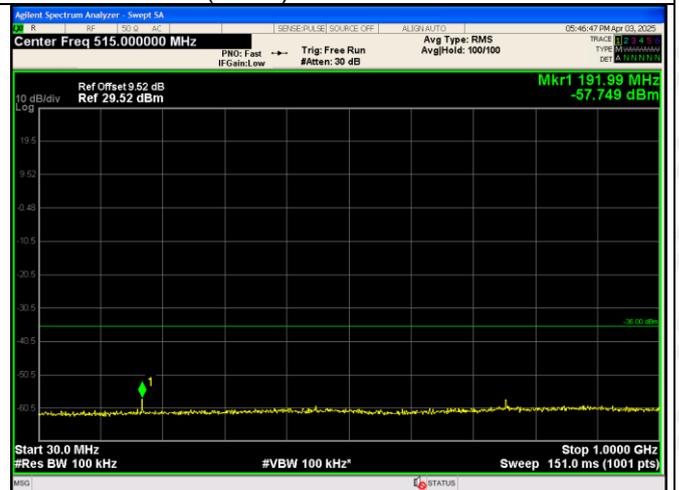
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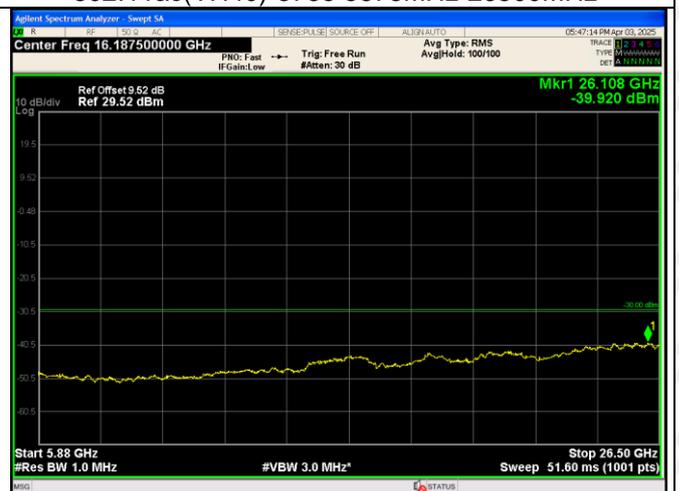
802.11ac(VH40)-5755 1000MHz-5725MHz



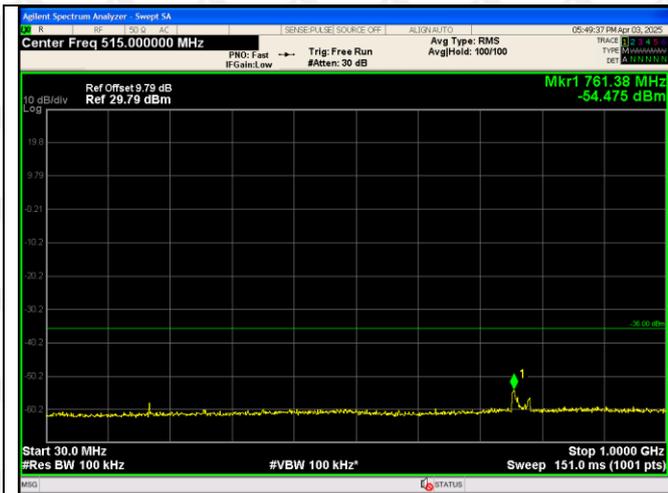
802.11ac(VH40)-5755 5875MHz-26500MHz



802.11ac(VH80)-5825 30MHz-1000MHz



802.11ac(VH80)-5755 1000MHz-5725MHz



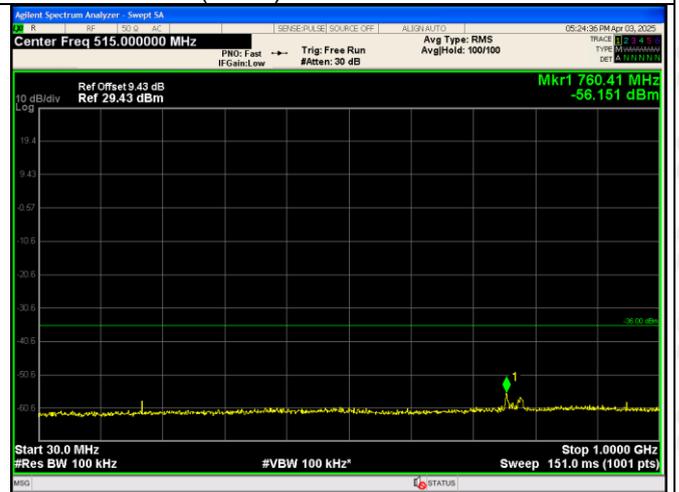
802.11ac(VH80)-5755 5875MHz-26500MHz



802.11n(HT20)-5745 30MHz-1000MHz



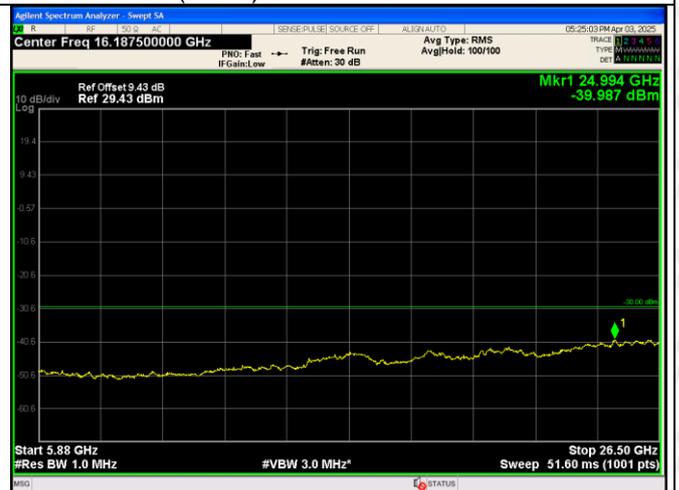
802.11n(HT20)-5745 1000MHz-5725MHz



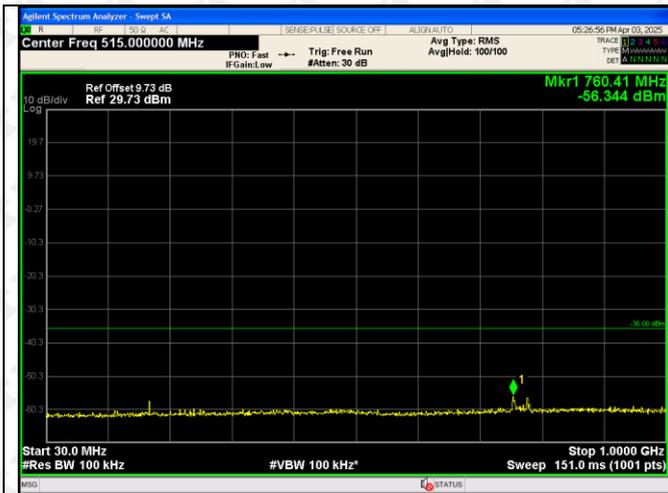
802.11n(HT20)-5745 5875MHz-26500MHz



802.11n(HT20)-5785 30MHz-1000MHz



802.11n(HT20)-5785 1000MHz-5725MHz



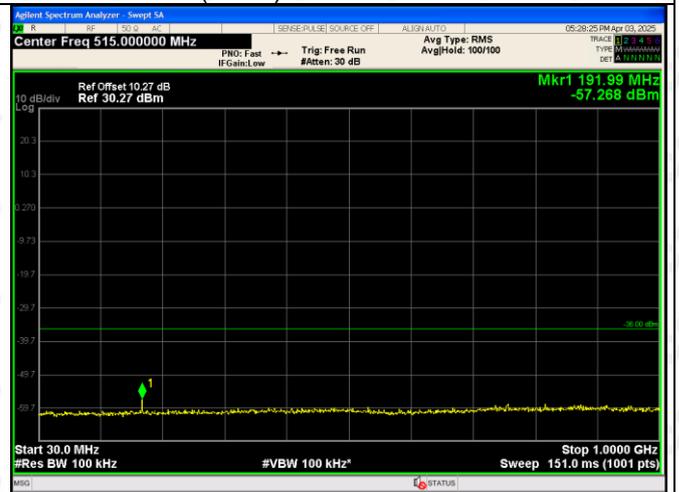
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802.11n(HT20)-5825 30MHz-1000MHz



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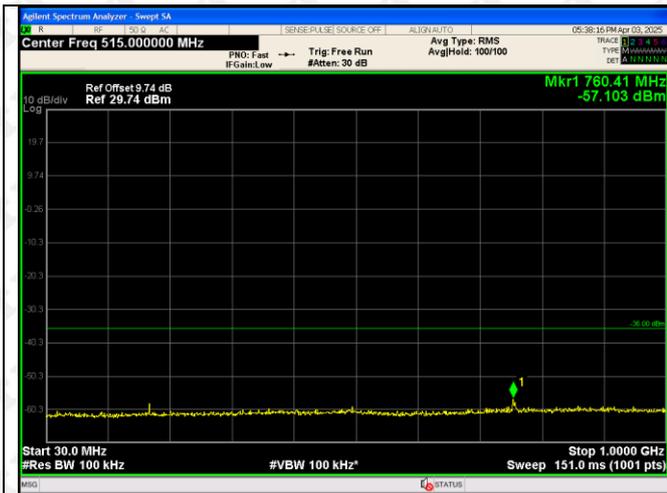
802.11n(HT20)-5825 5875MHz-26500MHz



802.11n(HT40)-5745 30MHz-1000MHz



802.11n(HT40)-5745 1000MHz-5725MHz



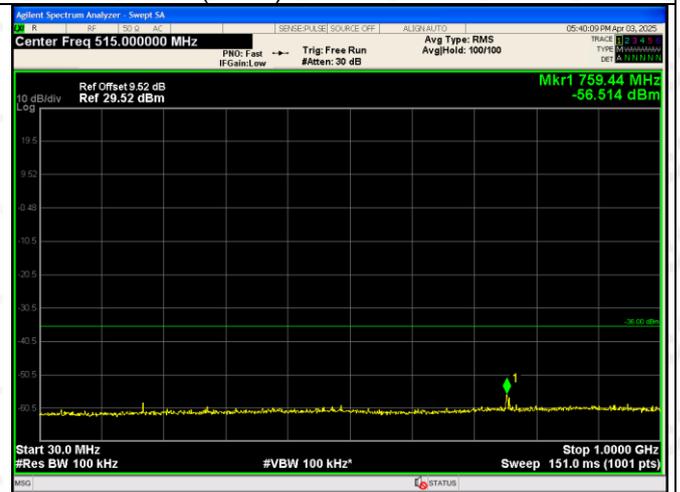
802.11n(HT40)-5745 5875MHz-26500MHz



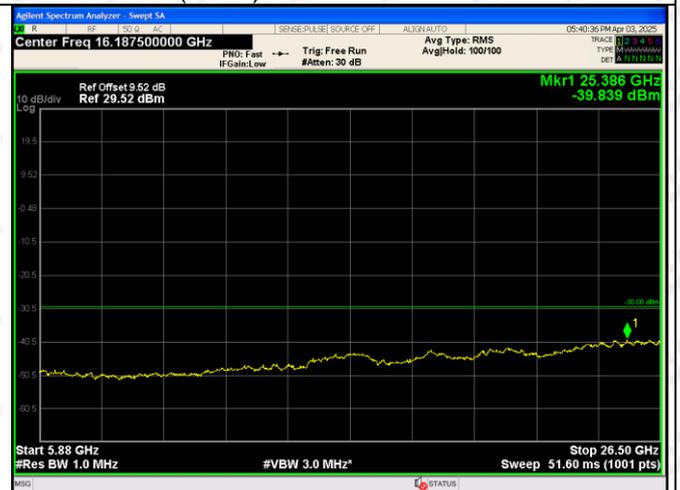
802.11n(HT40)-5785 30MHz-1000MHz



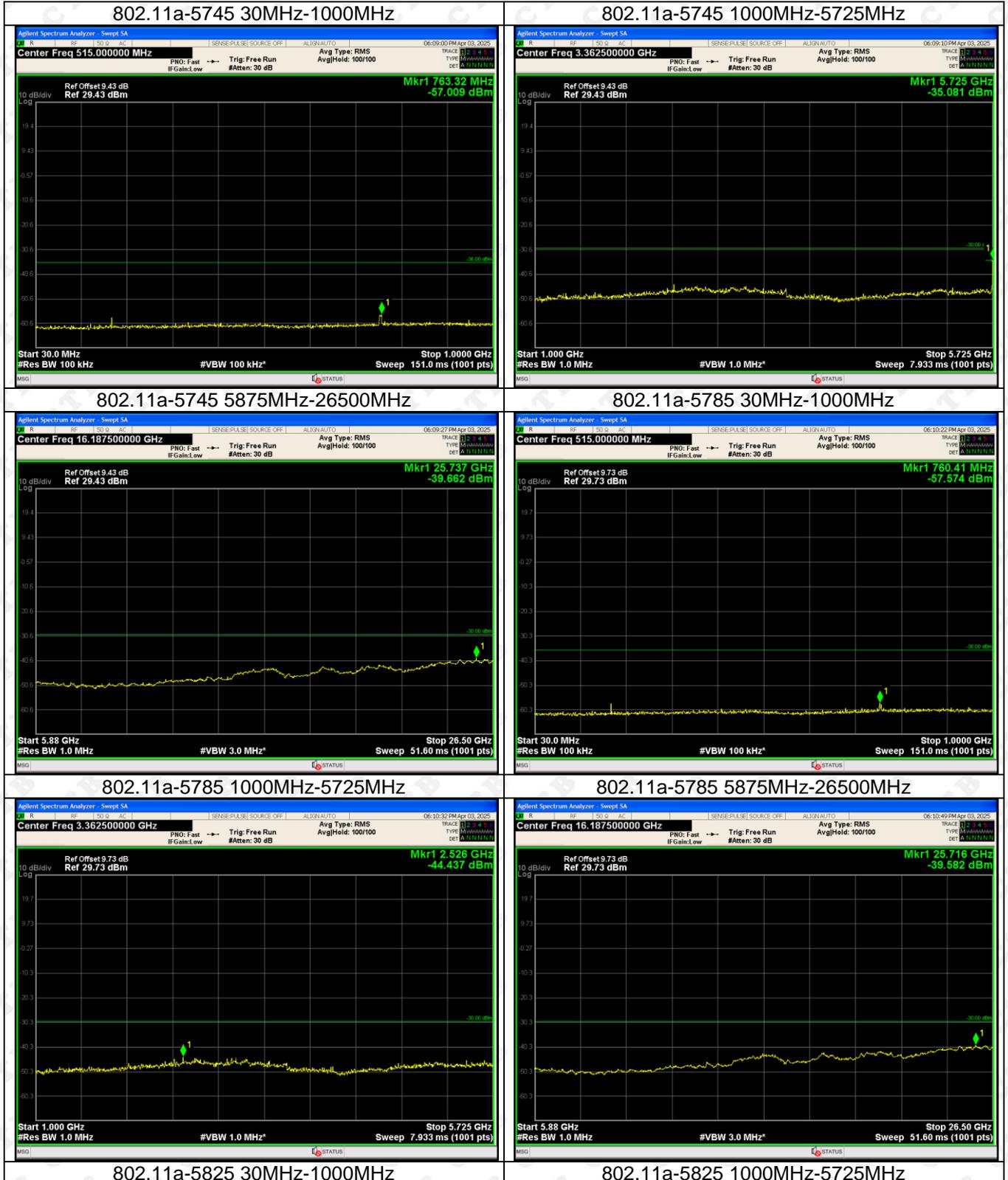
802.11n(HT40)-5785 1000MHz-5725MHz

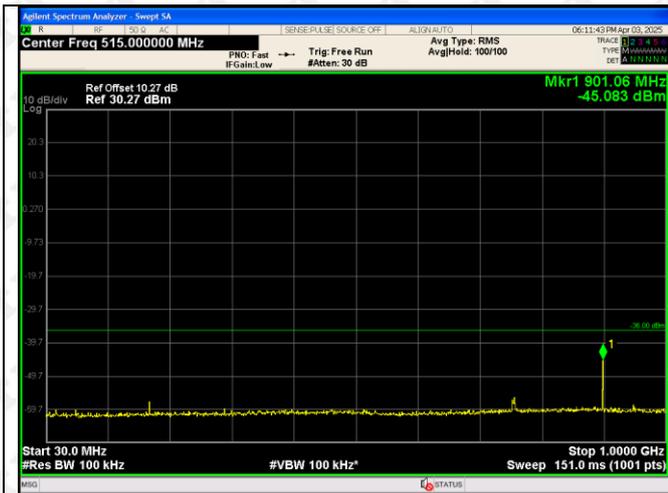


802.11n(HT40)-5785 5875MHz-26500MHz

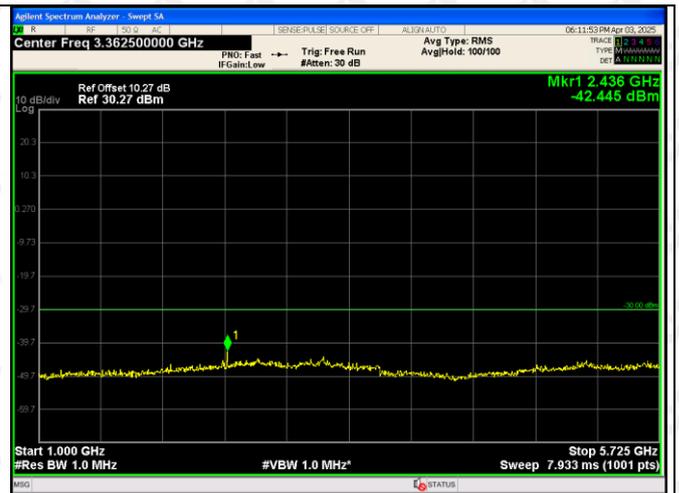


ANT2:





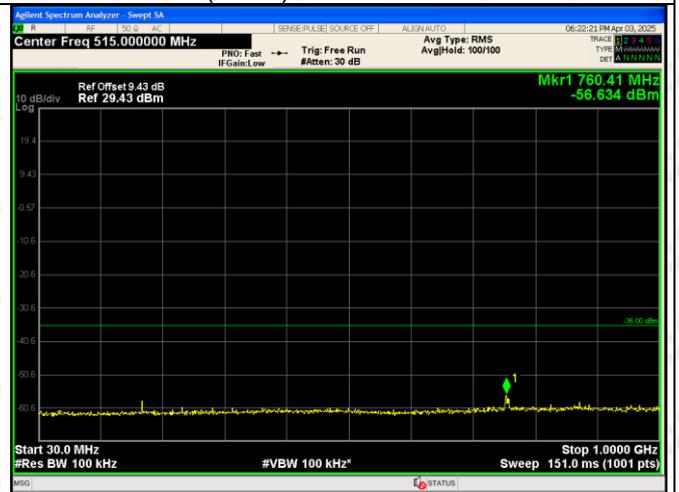
802.11a-5825 5875MHz-26500MHz



802.11ac(VH20)-5745 30MHz-1000MHz



802.11ac(VH20)-5745 1000MHz-5725MHz



802.11ac(VH20)-5745 5875MHz-26500MHz



802.11ac(VH20)-5785 30MHz-1000MHz



802.11ac(VH20)-5785 1000MHz-5725MHz



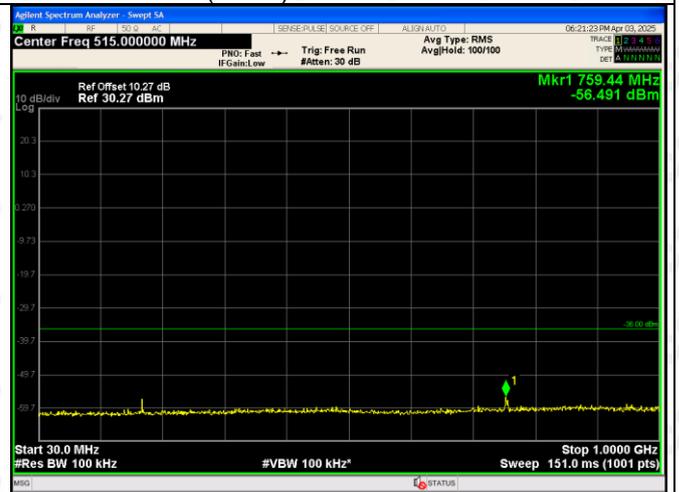
802.11ac(VH20)-5785 5875MHz-26500MHz



802.11ac(VH20)-5825 30MHz-1000MHz



802.11ac(VH20)-5825 1000MHz-5725MHz



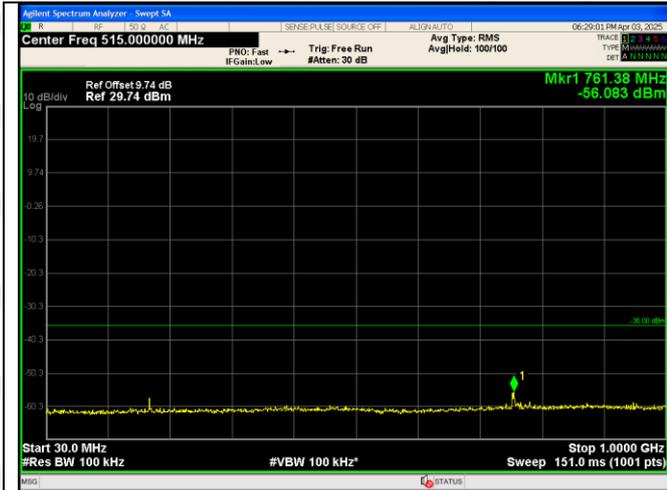
802.11ac(VH20)-5825 5875MHz-26500MHz



802.11ac(VH40)-5745 30MHz-1000MHz



802.11ac(VH40)-5755 1000MHz-5725MHz



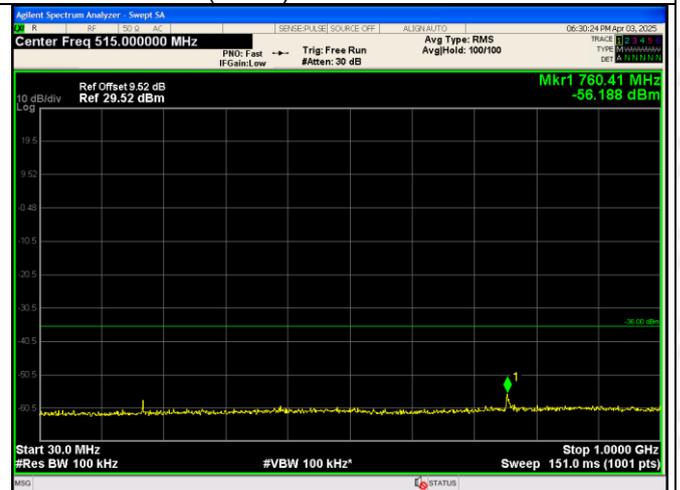
802.11ac(VH40)-5755 5875MHz-26500MHz



802.11ac(VH40)-5745 30MHz-1000MHz



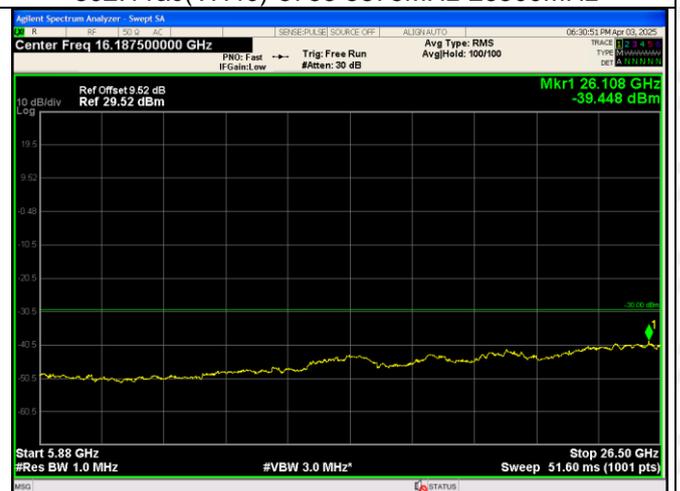
802.11ac(VH40)-5755 1000MHz-5725MHz



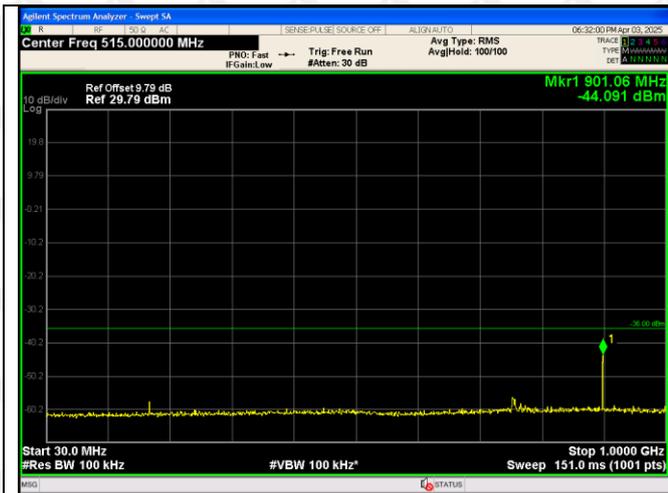
802.11ac(VH40)-5755 5875MHz-26500MHz



802.11ac(VH80)-5825 30MHz-1000MHz



802.11ac(VH80)-5755 1000MHz-5725MHz



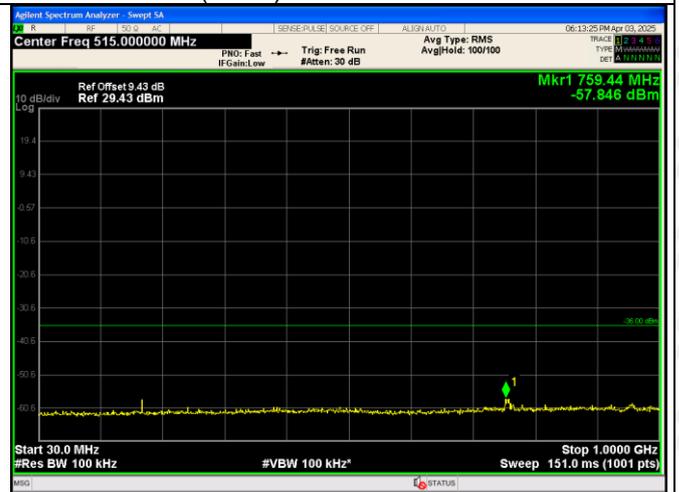
802.11ac(VH80)-5755 5875MHz-26500MHz



802.11n(HT20)-5745 30MHz-1000MHz



802.11n(HT20)-5745 1000MHz-5725MHz



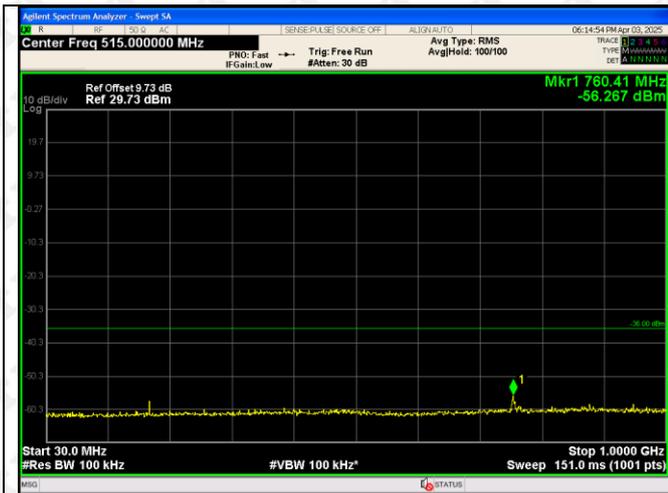
802.11n(HT20)-5745 5875MHz-26500MHz



802.11n(HT20)-5785 30MHz-1000MHz



802.11n(HT20)-5785 1000MHz-5725MHz



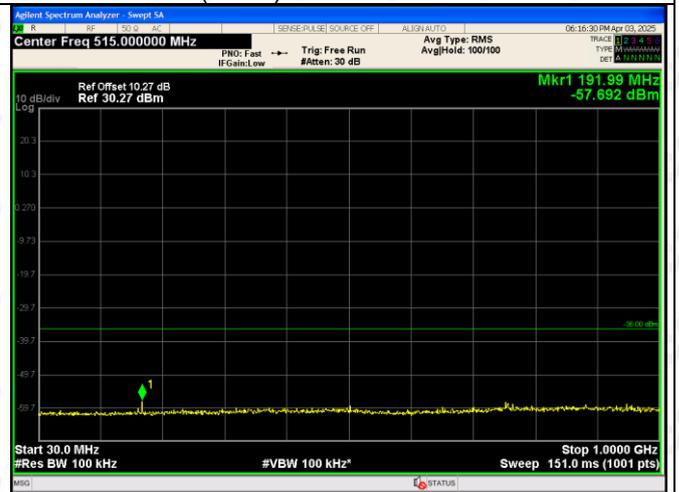
802.11n(HT20)-5785 5875MHz-26500MHz



802.11n(HT20)-5825 30MHz-1000MHz



802.11n(HT20)-5825 1000MHz-5725MHz



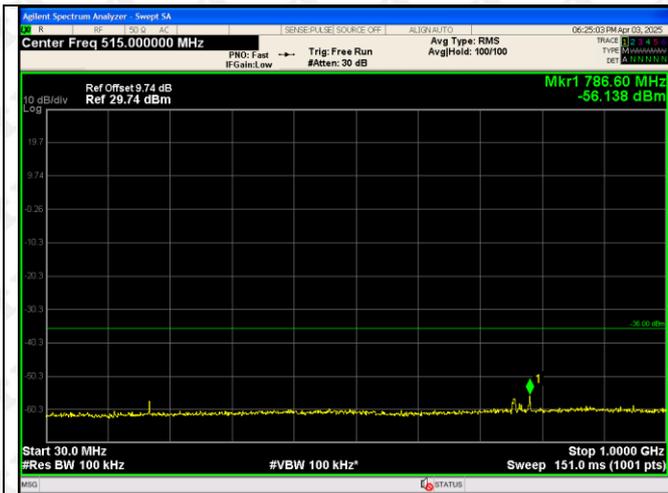
802.11n(HT20)-5825 5875MHz-26500MHz



802.11n(HT40)-5745 30MHz-1000MHz



802.11n(HT40)-5745 1000MHz-5725MHz



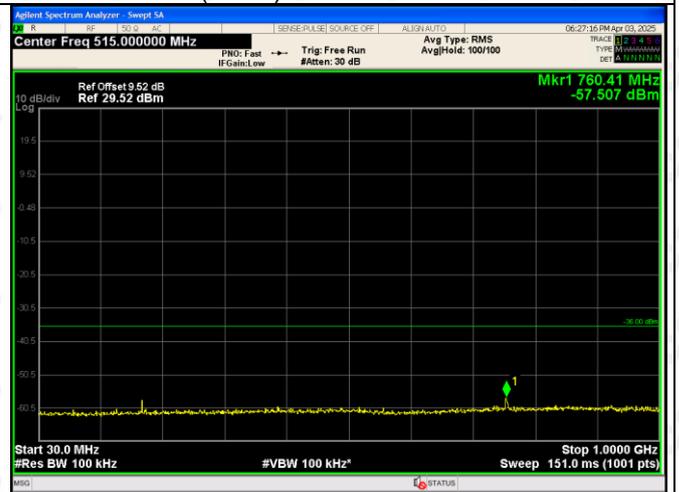
802.11n(HT40)-5745 5875MHz-26500MHz



802.11n(HT40)-5785 30MHz-1000MHz



802.11n(HT40)-5785 1000MHz-5725MHz



802.11n(HT40)-5785 5875MHz-26500MHz



10. TRANSMITTER UNWANTED EMISSIONS WITHIN THE 5725MHZ TO 5875MHZ BANDS

10.1 Test Configuration

The conformance requirements in clause 4.2.3.2 shall be verified under normal operating conditions and at those carrier centre frequencies defined in clause 5.3.2. The UUT shall be configured to operate at Pcond_1.

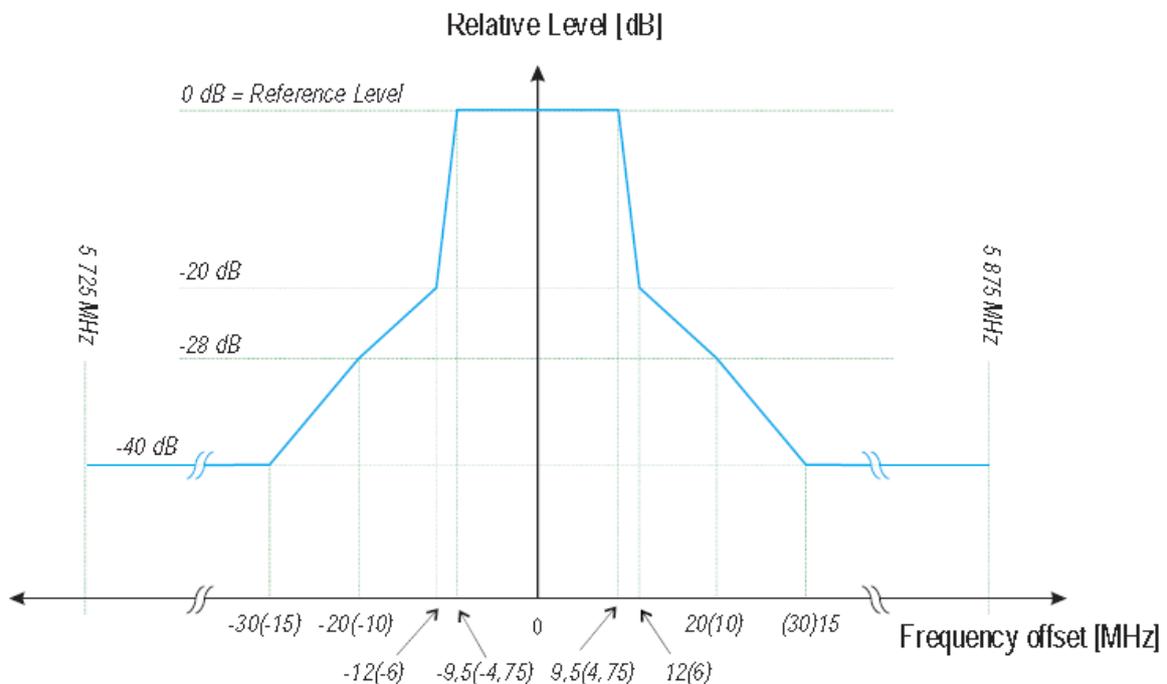
For UUT without an integral antenna and for a UUT with an integral antenna but with a temporary antenna connector, one of the following options shall be used:

- the level of unwanted emissions shall be calculated from their measured power in a specified load (conducted spurious emissions); or
- the level of unwanted emissions shall be measured as their effective radiated power when radiated by cabinet and antenna.

In the case where the UUT has an integral antenna, but no temporary antenna connector, only radiated measurements shall be used

10.2 LIMITS

The average level of the transmitted spectrum based on the declared ChS shall not exceed the limits given in figure 1 when operating under highest output power conditions.



NOTE 1: 0 dB Reference Level is the spectral density relative to the maximum spectral power density of the transmitted signal.

NOTE 2: On the Frequency Offset axis, the figures apply to ChS = 20 MHz whereas the figures in parentheses apply to ChS = 10 MHz.

NOTE 3: Emissions that fall outside the lower and upper band frequency limits of 5 725 MHz and 5 875 MHz respectively shall instead meet the unwanted emission limits of clause 4.2.3.1

10.3 Test procedure

The settings of the spectrum analyser shall be as follows:

- resolution bandwidth: 1 MHz;
- video bandwidth: 30 kHz;
- video averaging on.

The video signal of the spectrum analyser shall be "gated" such that the spectrum measured shall be measured between 4,0 μ s before the start of the burst to 4,0 μ s after the end of the burst.

NOTE 1: The "start of the burst" is the centre of the first sample of the preamble heading the burst. The "end of the burst" is the centre of the last sample in the burst.

This gating may be analogue or numerical, dependent upon the design of the spectrum analyser.

Determination of the reference average power level

The spectrum analyser shall be tuned to measurement frequencies at every 1 MHz interval within $f_c - 9,5$ (-4,75) MHz to $f_c + 9,5$ (4,75) MHz, with zero frequency scan. The maximum average power within $f_c - 9,5$ (-4,75) MHz to $f_c + 9,5$ (4,75) MHz (except f_c) is the reference level for relative power measurements on the channel centred at f_c and shall be recorded to compute relative power levels as described below.

Determination of the relative average power levels

The power level shall be measured in the range:

- 5 725 MHz to 5 875 MHz;

excluding the interval $f_c - 9,5$ (-4,75) MHz to $f_c + 9,5$ (4,75) MHz with a resolution bandwidth of 1 MHz and in a frequency scan mode. The average value of power relative to the reference average power level for the channel shall be noted.

NOTE 2: The figures in parenthesis apply to ChS = 10 MHz, whereas the figures not in parenthesis apply to ChS = 20 MHz.

10.4 TEST RESULTS

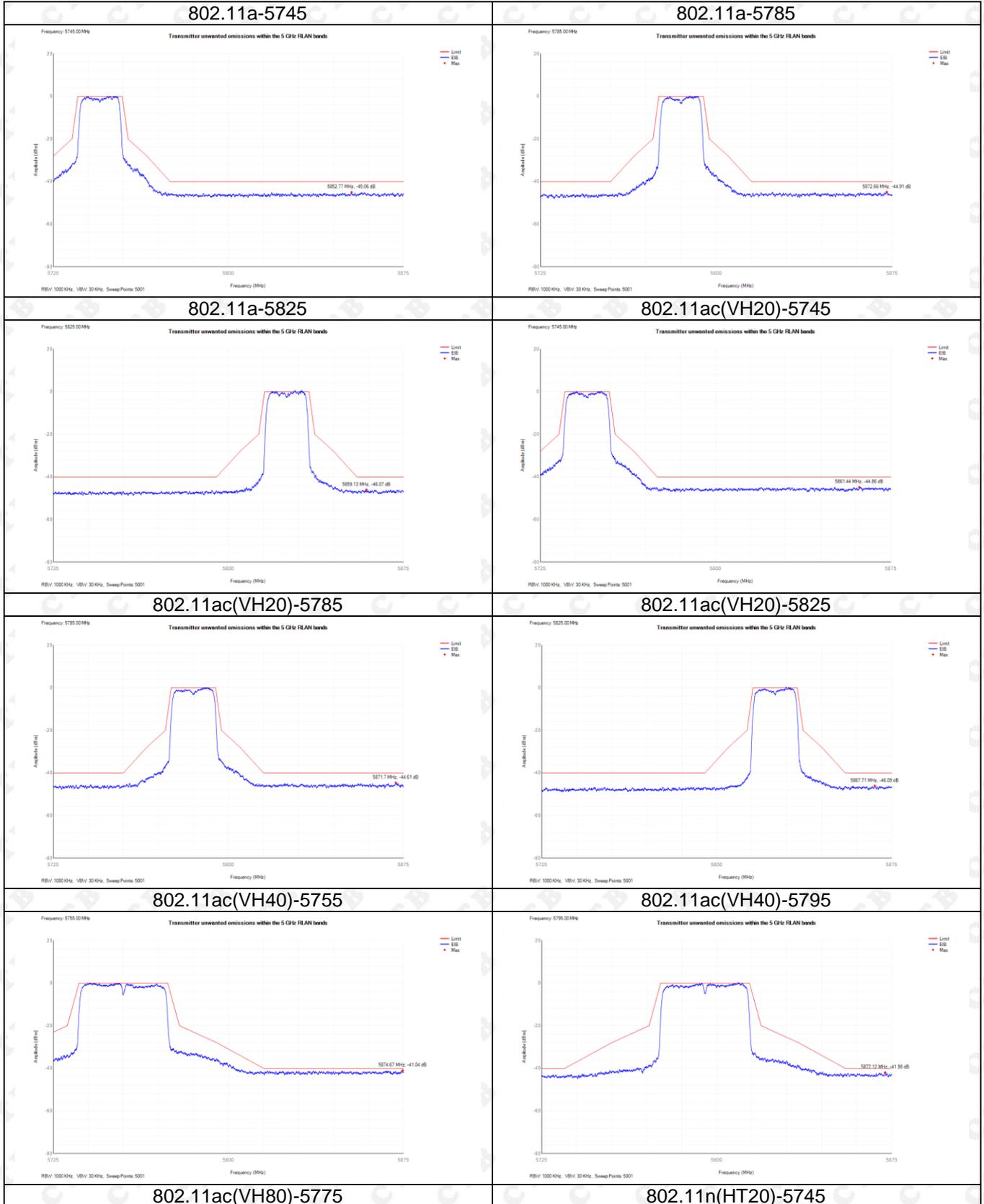
ANT1:

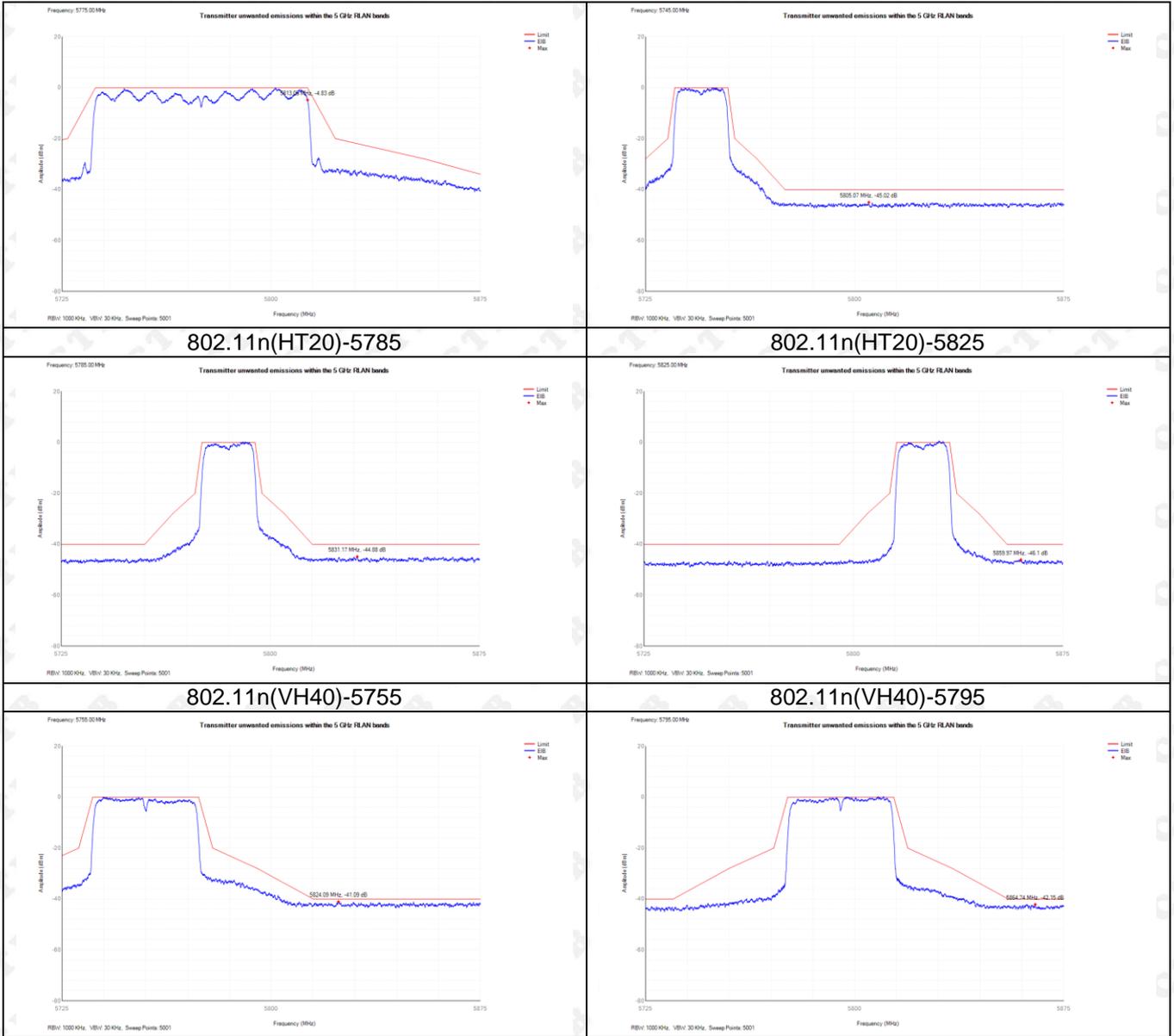
Modulation	Channel (MHz)	Worst EIB Frequency (MHz)	Level (dB)	Limit (dB)	Verdict
802.11a	LCH	5852.77	-45.06	-40	Pass
	MCH	5872.66	-44.91	-40	Pass
	HCH	5859.13	-46.07	-40	Pass
802.11(ac20)	LCH	5861.44	-44.86	-40	Pass
	MCH	5871.7	-44.61	-40	Pass
	HCH	5867.71	-46.09	-40	Pass
802.11(ac40)	LCH	5874.67	-41.04	-40	Pass
	HCH	5872.12	-41.98	-40	Pass
802.11(ac80)	HCH	5813.05	-4.83	-40	Pass
802.11(n20)	LCH	5805.07	-45.02	-40	Pass
	MCH	5831.17	-44.88	-40	Pass
	HCH	5859.97	-46.1	-40	Pass
802.11(n40)	LCH	5824.09	-41.09	-40	Pass
	HCH	5864.74	-42.15	-40	Pass

ANT2

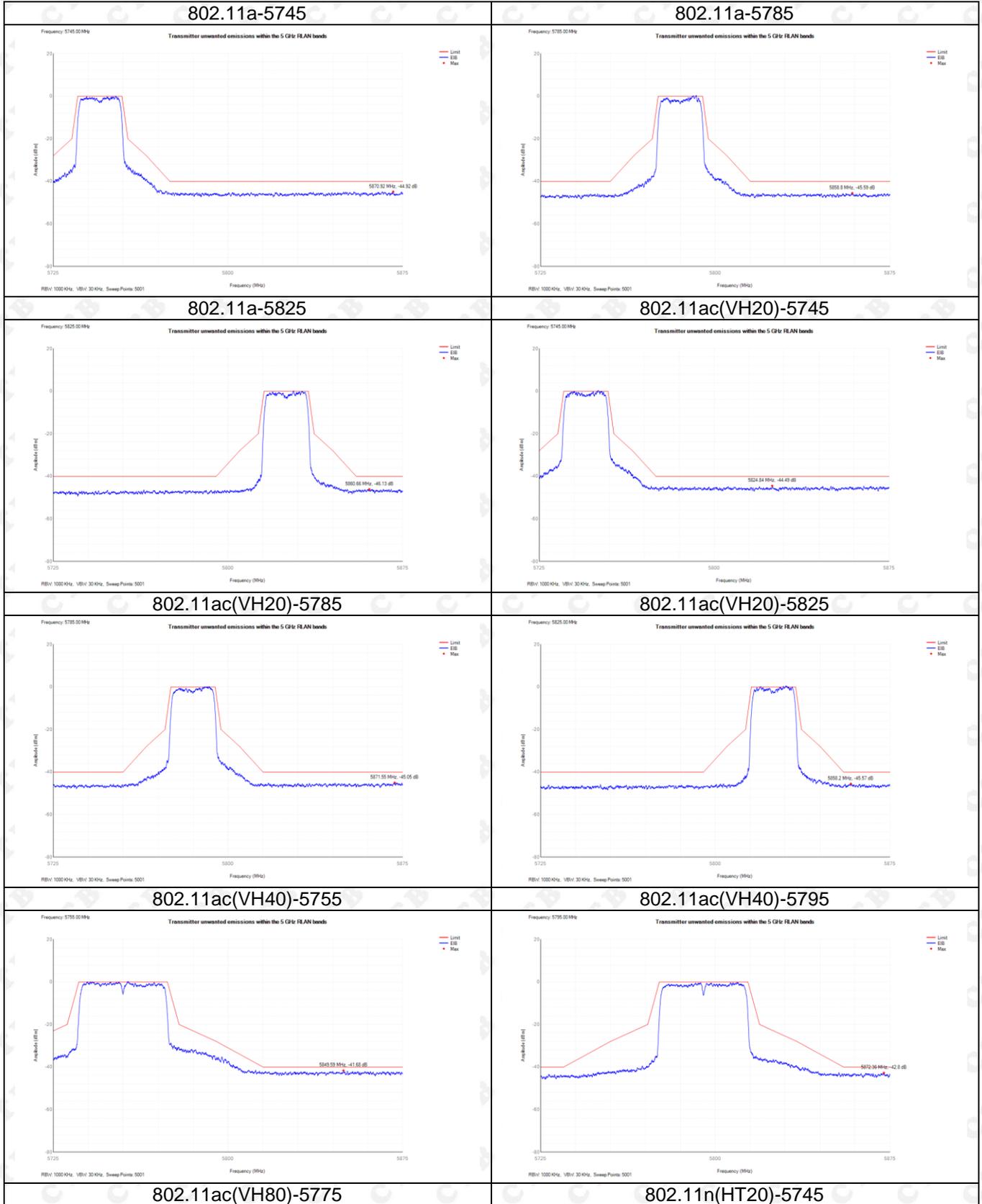
Modulation	Channel (MHz)	Worst EIB Frequency (MHz)	Level (dB)	Limit (dB)	Verdict
802.11a	LCH	5870.92	-44.92	-40	Pass
	MCH	5858.8	-45.59	-40	Pass
	HCH	5860.66	-46.13	-40	Pass
802.11(ac20)	LCH	5824.84	-44.49	-40	Pass
	MCH	5871.55	-45.05	-40	Pass
	HCH	5858.2	-45.57	-40	Pass
802.11(ac40)	LCH	5849.59	-41.68	-40	Pass
	HCH	5872.36	-42.8	-40	Pass
802.11(ac80)	HCH	5813.11	-5.8	-40	Pass
802.11(n20)	LCH	5867.65	-44.61	-40	Pass
	MCH	5844.46	-44.88	-40	Pass
	HCH	5857.84	-46.09	-40	Pass
802.11(n40)	LCH	5847.28	-41.72	-40	Pass
	HCH	5855.74	-42.76	-40	Pass

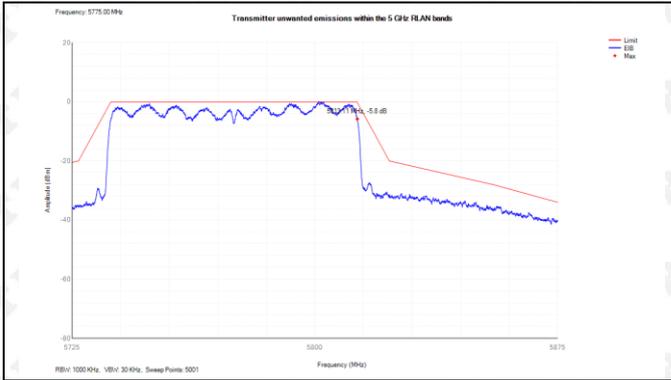
ANT1:



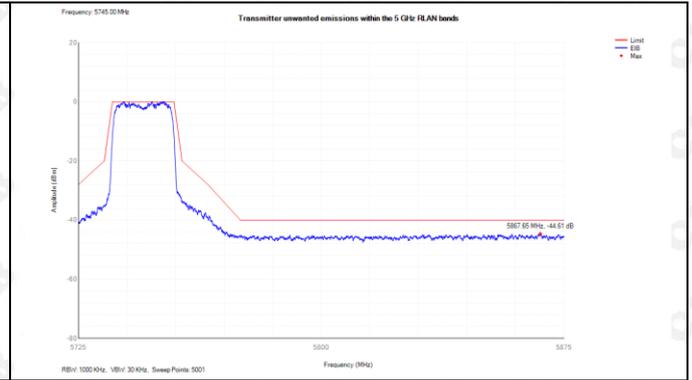


ANT2:

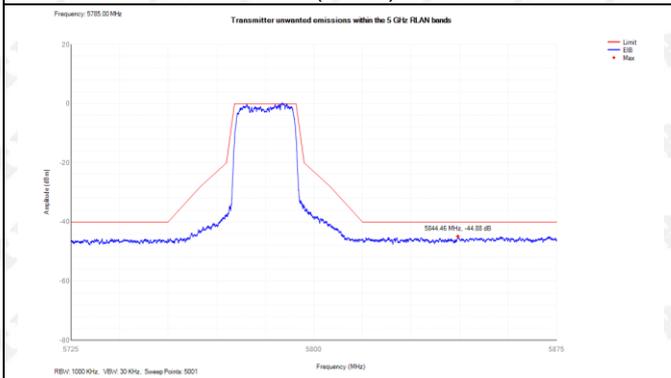




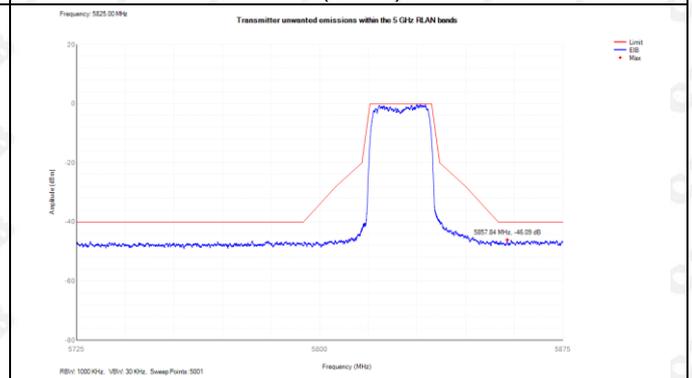
802.11n(HT20)-5785



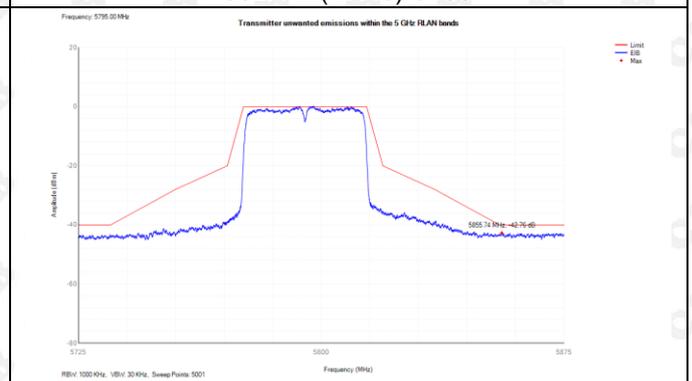
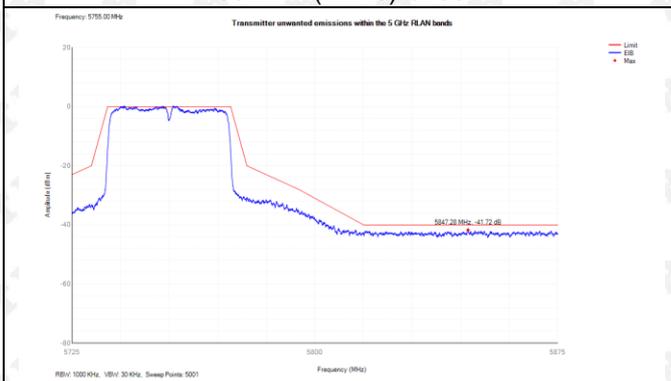
802.11n(HT20)-5825



802.11n(VH40)-5755



802.11n(VH40)-5795



11. RECEIVER SPURIOUS EMISSIONS

11.1 Test Configuration

The conformance requirements in clause 4.2.5 shall be verified under normal operating conditions, and at those carrier centre frequencies defined in clause 5.3.2.

For UUT without an integral antenna and for a UUT with an integral antenna but with a temporary antenna connector, one of the following options shall be used:

- the level of unwanted emissions shall be measured as their power in a specified load (conducted spurious emissions) and their effective radiated power when radiated by the cabinet or structure of the equipment with the antenna connector terminated by a specified load (cabinet radiation); or
- the level of unwanted emissions shall be measured as their effective radiated power when radiated by cabinet and antenna.

In the case where the UUT has an integral antenna, but no temporary antenna connector, only radiated measurements shall be used.

Test sequence (see clause 5.3.1.1) shall be applied to the receiver input at the reference sensitivity level according to the nominal bit rate.

11.2 LIMITS

The spurious emissions of the receiver shall not exceed the values in tables in the indicated bands:

Frequency range (MHz)	Maximum power	ERP measurement bandwidth
30 to 1 000	-57 dBm	100
1 GHz to 26,5 GHz	-47 dBm	1000

11.3 Test Procedures

Using a directional coupler, circulator or gating to remove the test data transmissions (and/or other means to isolate the emissions measurements instrument from the test data signals transmitted) the radio emissions from the UUT shall be measured while the UUT receives test data.

The settings of the spectrum analyser shall be as follows:

- frequency scan allowed;
- resolution bandwidth: 1 MHz or 100 kHz as appropriate (see table 3);
- video bandwidth: 1 MHz;
- video averaging on, or peak hold.

Tuning the spectrum analyser centre frequency over the measurement frequency bands specified in table 3, the power level of UUT receiver emissions shall be measured during test data transmissions. If gating is used to remove the unwanted energy from the test data transmissions, the tuning of the spectrum analyser shall not change during the gated-out time interval.

11.4 TEST RESULTS

ANT1:

The worse test 802.11n(HT20) Low channel

Rx in operation mode				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
49.39	Vertical	-70.33	-57.00	Pass
126.46	V	-70.19	-57.00	
188.68	V	-68.58	-57.00	
387.74	V	-69.53	-57.00	
506.96	V	-69.21	-57.00	
677.19	V	-67.38	-57.00	
956.01	V	-66.90	-57.00	
1736.76	V	-67.35	-47.00	
2423.88	V	-67.22	-47.00	
3292.55	V	-70.13	-47.00	
133.35	Horizontal	-68.80	-57.00	
216.11	H	-69.00	-57.00	
359.55	H	-68.66	-57.00	
485.45	H	-67.60	-57.00	
690.90	H	-68.21	-57.00	
868.63	H	-67.63	-57.00	
1736.98	H	-68.17	-47.00	
2421.32	H	-68.50	-47.00	
3290.98	H	-70.33	-47.00	
Rx in standby Mode				
N/A: Not applicable, since the spurious emission of the EUT is too weak to be detected.(≤ -80 dBm)				

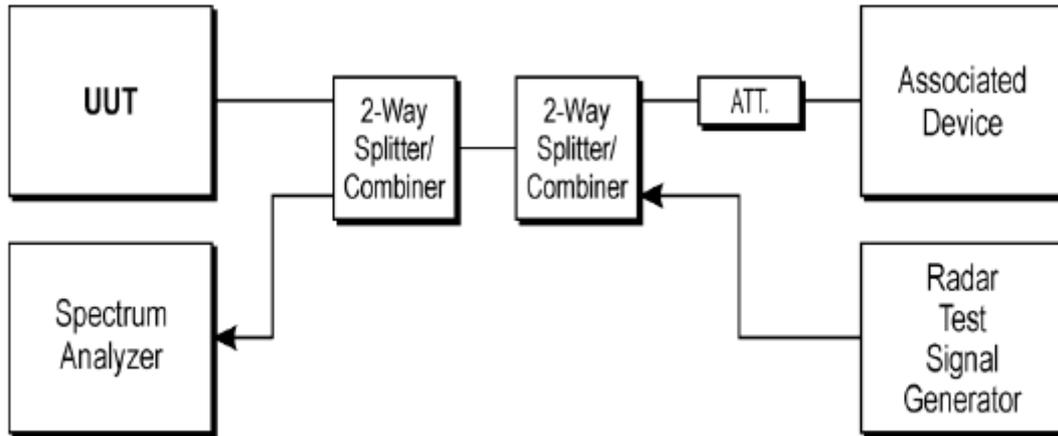
ANT2:

The worse test 802.11n(HT20) Low channel

Rx in operation mode				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result
	polarization	Level(dBm)		
49.39	Vertical	-69.41	-57.00	Pass
126.46	V	-69.85	-57.00	
188.68	V	-70.19	-57.00	
387.74	V	-68.69	-57.00	
506.96	V	-69.29	-57.00	
677.19	V	-69.19	-57.00	
956.01	V	-68.07	-57.00	
1736.76	V	-67.20	-47.00	
2423.88	V	-67.75	-47.00	
3292.55	V	-67.23	-47.00	
133.35	Horizontal	-69.62	-57.00	
216.11	H	-68.69	-57.00	
359.55	H	-69.35	-57.00	
485.45	H	-68.63	-57.00	
690.90	H	-67.90	-57.00	
868.63	H	-68.37	-57.00	
1736.98	H	-67.15	-47.00	
2421.32	H	-68.51	-47.00	
3290.98	H	-68.36	-47.00	
Rx in standby Mode				
N/A: Not applicable, since the spurious emission of the EUT is too weak to be detected.(≤-80dBm)				

12. DYNAMIC FREQUENCY SELECTION

12.1 Test Configuration



12.2 LIMITS

Table D.1: DFS requirement values

Parameter	Value
Channel Availability Check Time	60 s
Channel Move Time	10 s
Channel Closing Transmission Time	260 ms
Non-Occupancy Period	30 minutes
Channel Revalidation Period	24 hours

12.3 Test Procedures

The steps below define the procedure to verify the Channel Shutdown process and to determine the Channel Closing

Transmission Time, the Channel Move Time and the Non-Occupancy Period. This is illustrated in figure 8.

a) the signal generator and the UUT shall be connected using the test set up described in clause 5.4.6.1.3;
 b) the UUT shall transmit a test transmission sequence in accordance with clause 5.1.2.2 on the selected channel

Chr;

c) at a certain time T_0 , a radar signal is generated on Chr using radar test signal #1 defined in table D.3 a) and at a

level of 10 dB above the level defined in clause 5.4.6.2.1 on the selected channel. T_1 denotes the end of the radar test signal;

d) the transmissions of the UUT following instant T_1 on the selected channel shall be observed for a period greater than or equal to the Channel Move Time defined in table D.1. The aggregate duration (Channel Closing Transmission Time) of all transmissions from the UUT during the Channel Move Time shall be compared to the limit defined in table D.1

The aggregate duration of all transmissions of the UUT does not include quiet periods in between transmissions of the UUT.

e) T_2 denotes the instant when the UUT has ceased all transmissions on the channel. The time difference between

T_1 and T_2 shall be measured. This value (Channel Move Time) shall be noted and compared with the limit defined in table D.1;

f) following instant T_2 , the selected channel shall be observed for a period equal to the Non-Occupancy Period

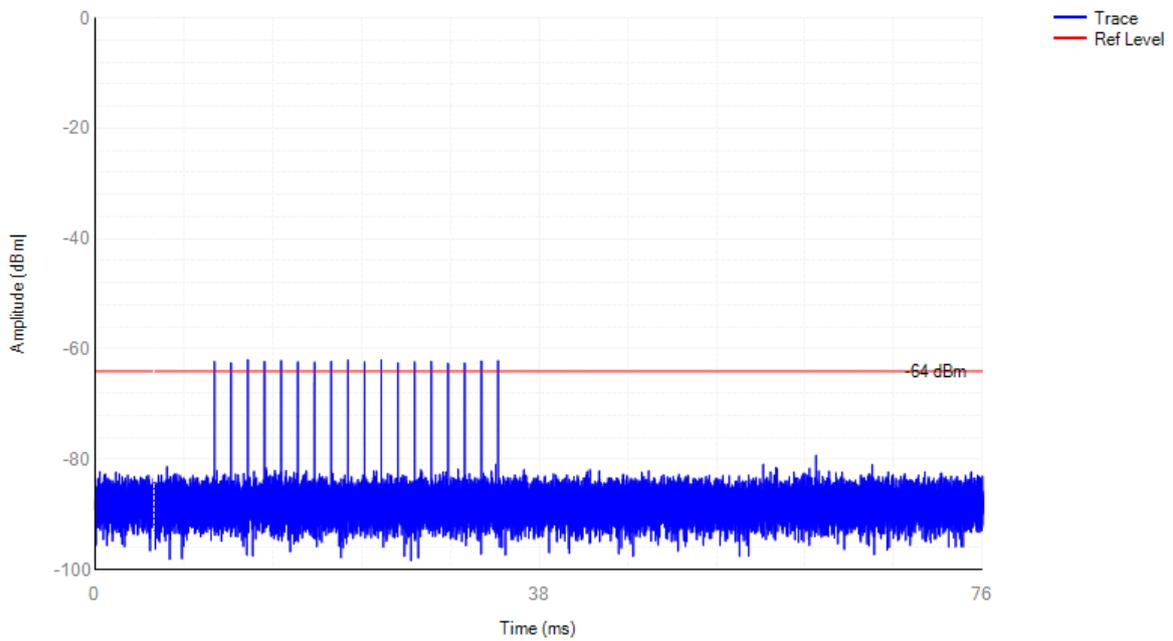
(T3-T2) to verify that the UUT does not resume any transmissions on this channel.

12.4 TEST RESULTS

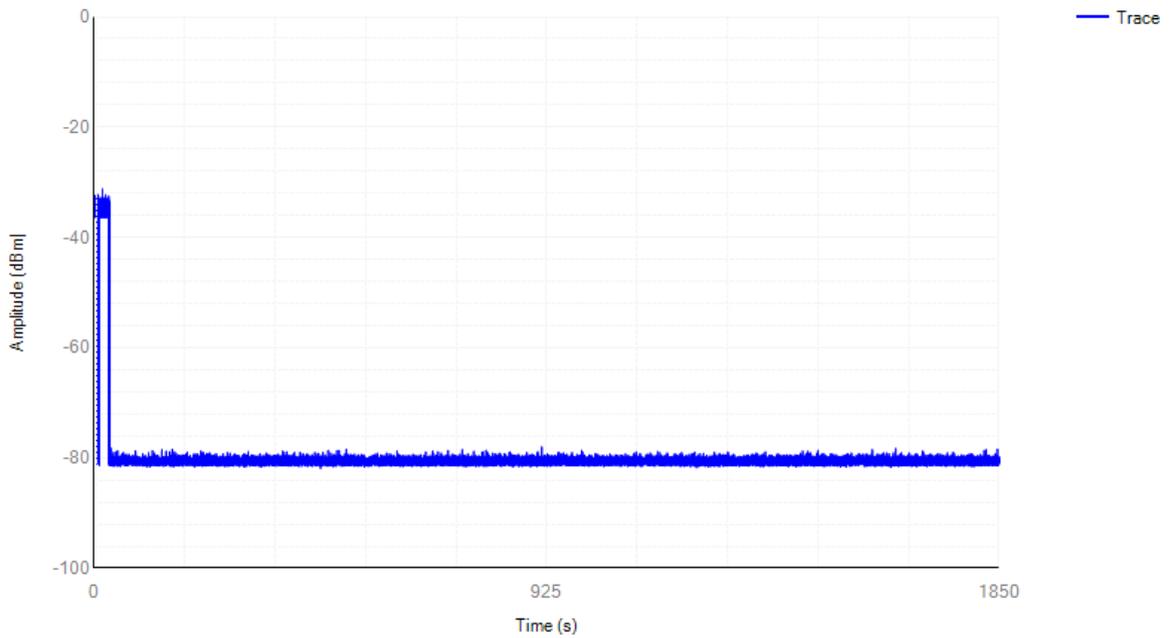
Mode	Frequency (MHz)	Channel Move Time (s)	Limit Channel Move Time (s)	Close Transmission Time (s)	Limit Close Transmission Time (s)	Verdict
a	5300	0.6078	10	0.0232	0.26	Pass

5745MHz a20

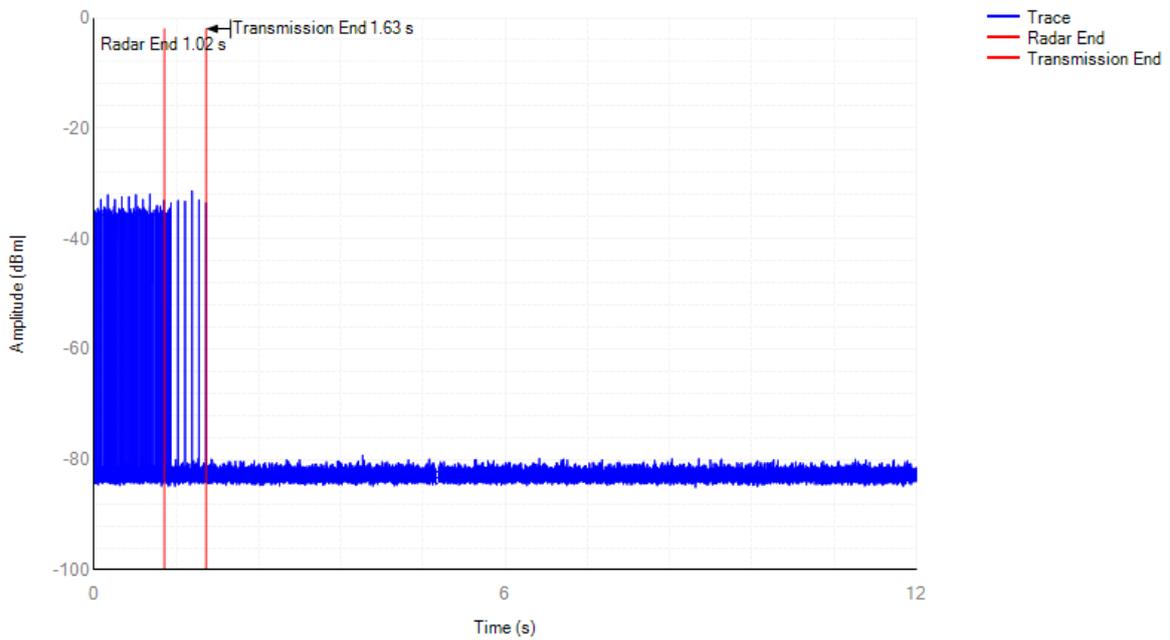
Radar Calibration



Non-Occupancy period



Channel Shutdown



13. RECEIVER BLOCKING

13.1 Test Configuration

See clause 5.1 for the environmental test conditions. These measurements shall only be performed at normal test conditions.

The channels on which the conformance requirements in clause 4.2.7.4 shall be verified are defined in clause 5.3.2.

The UUT shall operate in its normal operational mode.

Devices which can change their operating frequency automatically (adaptive channel allocation), this function shall be disabled.

If the equipment can operate with different Nominal Channel Bandwidths (e.g. 10 MHz and 20 MHz) and different data rates, then the smallest channel bandwidth shall be used together with the lowest data rate for this channel bandwidth. This mode of operation shall be aligned with the performance criteria defined in clause 4.2.7.3 as declared by the manufacturer (see clause 5.4.1) and shall be described in the test report.

It shall be verified that this performance criteria as defined by the manufacturer is achieved during the blocking test

13.2 LIMITS

While maintaining the minimum performance criteria as defined in clause 4.2.7.3, the blocking levels at specified frequency offsets shall be equal to or greater than the limits defined in table 4.

Table 4: Receiver Blocking parameters

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm)	Type of blocking signal
Pmin + 6 dB	5 420	-42	CW
	5 925		
Pmin + 6 dB	5 320		
	6 025		
	6 125	CW	

NOTE 1: Pmin is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.2.7.3 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.

13.3 Test Procedures

For systems using multiple identical receive chains only one chain need to be tested. All other receiver inputs shall be terminated.

Figure 9 shows the test set-up which can be used for performing the receiver blocking test.

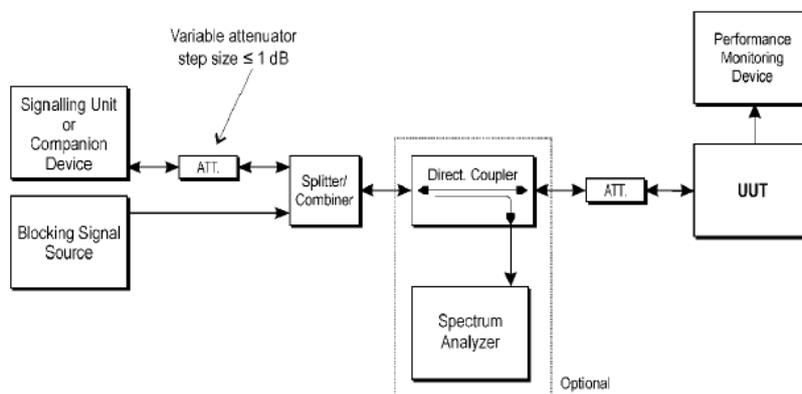


Figure 9: Test Set-up for receiver blocking

The steps below define the procedure to verify the receiver blocking requirement as described in clause 4.2.7.

Step 1:

- The UUT shall be set to the operating frequency to be tested (see clause 5.3.2).

Step 2:

- The blocking signal generator is set to the first frequency as defined in table 4.

Step 3:

• With the blocking signal generator switched off a communication link is set up between the UUT and the associated companion device using the test setup shown in figure 9. The variable attenuator is set to the highest possible attenuation that still achieves the minimum performance criteria as specified in clause 4.2.7.3 with a resolution of at least 1 dB. The resulting level for the wanted signal at the input of the UUT is P_{min} . This value shall be measured and recorded in the test report.

- Then the value of attenuation is reduced by 6 dB resulting in a new level ($P_{min} + 6$ dB) of the wanted signal at the UUT receiver input. This level shall be recorded.

Step 4:

• The level of the blocking signal at the UUT input is set to the level provided in table 4. It shall be verified and recorded in the test report that the performance criteria as specified in clause 4.2.7.3 is met.

Step 5:

- Repeat step 4 for each remaining combination of frequency and level as specified in table 4.

Step 6:

• Repeat step 2 to step 5 with the UUT operating at the other operating frequencies at which the blocking test has to be performed. See clause 5.4.7.1.

13.4 TEST RESULTS

Remark: This Report only show the test plots of the ANT1+ANT2 worst case.
The worse test 802.11n(HT20) Low channel

Blocking signal frequency (MHz)	Blocking signal power (dBm)	Type of blocking signal	PER(%)	Result
5420	-42	CW	3.65	Pass
5925	-42	CW	3.72	Pass
5320	-42	CW	4.33	Pass
6025	-42	CW	4.64	Pass
6125	-42	CW	3.89	Pass

14. USER ACCESS RESTRICTIONS

14.1 Applicable standard

ETSI EN 302 502 clause 4.2.8

14.2 LIMITS

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 4.2.6.2.

14.3 Test Results

The EUT can restricts user to restrict access to hardware and software setting of the equipment through making it be disabled and altered.

PASS

15. EUT TEST SETUP PHOTOGRAPHS

Spurious emissions

**※※※※※ END OF REPORT ※※※※※**