

FCC & IC TEST REPORT for UNII Device (5.1G & 5.8G Band) No. 161201799SHA-002

Applicant : Pass & Seymour, Inc., d/b/a Legrand
301 Fulling Mill Road, Suite G, Middletown,
Pennsylvania 17057 USA

Manufacturer : Hzsamko Technologies Co.,Ltd.
No.8,Jiaqi Road,Xianlin Street,Yuhang District,Hangzhou,
China.

Equipment : Player Subsystem

Type/Model : PCBA-200010-01 Player System

SUMMARY

The equipment complies with the requirements according to the following standard(s):

47CFR Part 15 (2015): Radio Frequency Devices

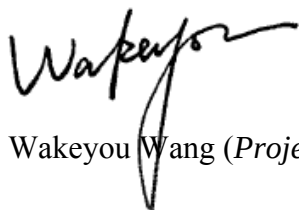
ANSI C63.10 (2013): American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

RSS-247 (Issue 1, 2015): Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

RSS-Gen Issue 4 (November 2014): General Requirements and Information for the Certification of Radiocommunication Equipment

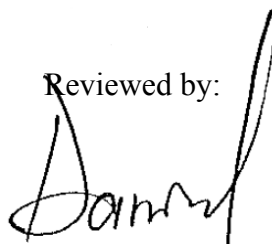
Date of issue: Jan 9, 2017

Prepared by:



Wakeyou Wang (Project Engineer)

Reviewed by:



Daniel Zhao (Reviewer)



Description of Test Facility

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1. General Information

1.1 Applicant Information

Applicant: Pass & Seymour, Inc., d/b/a Legrand
301 Fulling Mill Road, Suite G, Middletown,
Pennsylvania 17057 USA

Name of contact: Fred G. Duffy

Tel: (717)5465413

Fax: (717)7022546

Manufacturer: Hzsamko Technologies Co.,Ltd.
No.8,Jiaqi Road,Xianlin Street,Yuhang
District, Hangzhou, China.

Sample received date : Dec 20, 2016

Sample Identification No : /

Date of test : Dec 20, 2016 ~ Dec 30, 2016

1.2 Identification of the EUT

Equipment: Player Subsystem

Type/model: PCBA-200010-01 Player System

FCC ID: YV8-20001001

IC: 9922A-20001001

1.3 Technical specification

Operation Frequency Band: 5180 - 5240 MHz, 5745 – 5825MHz

Modulation: BPSK@6/9 Mbps
QPSK@12/18Mbps
16-QAM@24Mbps
64-QAM@48/54Mpb and above

Gain of Antenna:

Antenna Type	Gain of antenna
Embedded WIFI Dual Band Antenna	2.4GHz band: 2.79dBi
	5GHz band: 4.20dBi

Rating: DC 5V

Description of EUT: The EUT is a wireless audio device containing Wi-Fi module.

Port identification: Audio in × 1; Audio out × 1; USB × 1; LAN × 1

Category of EUT: Class B

EUT type: ☒ Table top ☐ Floor standing

Used conduction: ☒ Indoor only ☐ Outdoor ☐ Indoor & Outdoor

EUT Modes: 802.11a/b/g/n20 (802.11a/n20 assessed in this report)

Channel Number: Channel 36 - 48, Channel 149 - 165

Channel Description: The channel spacing is 20MHz.

MIMO Function Description:

Freq. Band	Modulation	Transmission / Idle		Beam forming	Beam forming gain
		Chain 1	Chain 2		
5180 - 5240MHz	802.11a	Transmission	Idle	NO	0 dBi
5745 – 5825MHz	802.11 n20	Transmission	Transmission	NO	0 dBi

1.4 Mode of operation during the test / Test peripherals used

While testing transmitting mode of EUT, the internal modulation was applied.

The lowest, middle and highest channel were tested as representatives.

Item No.	Name	Band and Model	Description
1	Laptop computer	HP ProBook 6470b	NA
2	AC/DC adapter	Lenovo C-P64	AC 100-240V input; DC 5V, 1.5A output

Product SW/HW version	Radio SW/HW version	Test SW Version
N/A	N/A	N/A

Test software setting:

The power level setting for 802.11a/n is used with the software offered by the manufactory.

Mode	Frequency (MHz)	Software Setting	Duty Cycle
802.11a 802.11n20	5180	16.0	99%
	5200	16.0	99%
	5240	16.0	99%
	5745	16.0	99%
	5785	16.0	99%
	5825	16.0	99%

Data rate VS Power

The pre-scan for the conducted power with all rates in each modulation and bands was used, and the worst case was found and used in all test cases.

After this pre-scan, we choose the following table of the data rate as the worst case.

Mode	Worst case data rate
802.11a	6Mbps
802.11 n20	MCS8

2. Test Specification

2.1 Instrument list

Equipment	Type	Manu.	Internal no.	Cal. Date	Due date
Test Receiver	ESCS 30	R&S	EC 2107	2016-10-21	2017-10-20
Test Receiver	ESIB 26	R&S	EC 3045	2016-10-20	2017-10-19
A.M.N.	ESH2-Z5	R&S	EC 3119	2016-1-9	2017-1-8
Bilog Antenna	CBL 6112D	TESEQ	EC 4206	2016-4-28	2017-4-27
Horn antenna	HF 906	R&S	EC 3049	2016-4-28	2017-4-27
Pre-amplifier	Pre-amp 18	R&S	EC 3222	2016-4-12	2017-4-11
Semi-anechoic chamber	-	Albatross project	EC 3048	2016-5-12	2017-5-11
High Pass Filter	WHKX 1.0/15G-10SS	Wainwright	EC4297-1	2016-1-8	2017-1-7
Power sensor / Power meter	N1911A/N1921A	Agilent	EC4318	2016-04-12	2017-04-11
Temperature Camber	SETH-E	tayasaf	EC4315	2016-4-9	2017-4-8
Spectrum analyzer	E7402A	Agilent	EC2254	2016-08-16	2017-08-15

2.2 Test Standard

47CFR Part 15:2015
 ANSI C63.10 (2013)
 RSS-247 (Issue 1, 2015)
 RSS-Gen Issue 4 (November 2014)
 789033 D02 General UNII Test Procedures New Rules v01r03

2.3 Test Summary

This report applies to tested sample only. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.

TEST ITEM	FCC REFERENCE	IC REFERENCE	RESULT
Maximum Conducted Output Power & EIRP	15.407(a)	RSS-247 Issue 1 Clause 6	Pass
Power spectral density	15.407(a)	RSS-247 Issue 1 Clause 6	Pass
Minimum 6dB Bandwidth	15.407(e)	RSS-247 Issue 1 Clause 6	Pass
Radiated emission	15.407(b), 15.209	RSS-247 Issue 1 Clause 6	Pass
Power line conducted emission	15.207	RSS-Gen Issue 4 Clause 8.8	Pass
26 dB Bandwidth	15.403(i)	/	Tested
99% Bandwidth	/	RSS-Gen Issue 4 Clause 6.6	Tested

3. Maximum Conducted Output Power & EIRP

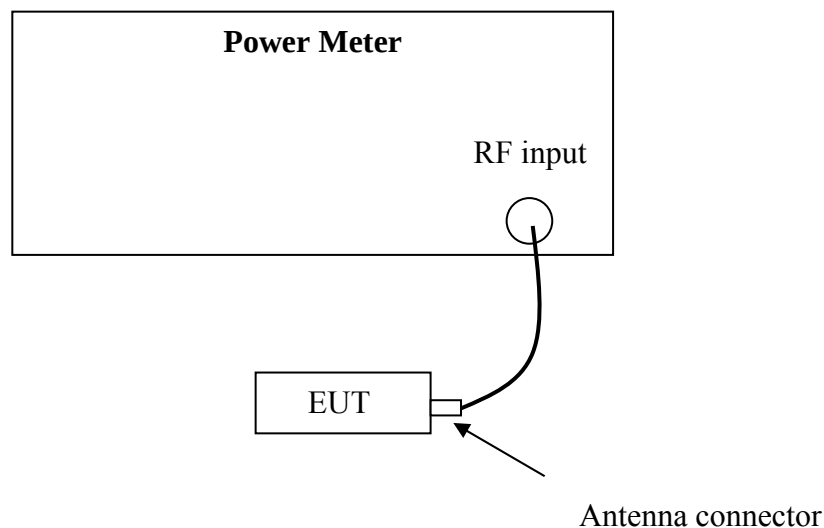
Test result: Pass

3.1 Test limit

- ☐ For outdoor access point operating in 5150-5250MHz: 30dBm, Maximum EIRP at any elevation angle above 30 degrees ≤ 21 dBm;
- ☐ For indoor access point operating in 5150-5250MHz: 30dBm;
- ☐ For fixed point-to-point access point operating in 5150-5250MHz: 30dBm;
- ☒ For device operating in 5150-5250MHz: Maximum EIRP ≤ 23 dBm or $10\text{dBm} + 10\log B$ (B is 99% bandwidth), whichever power is less;
- ☐ For device operating in 5.25-5.35 GHz and 5.47-5.725 GHz: 24dBm or $11\text{dBm} + 10\log B$ (B is 26dB bandwidth);
- ☒ For device operating in 5.725-5.85 GHz: 30dBm

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi (For fixed point-to-point access point operating in 5150-5250MHz, replaced with 23dBi).

3.2 Test Configuration



3.3 Test procedure and test setup

The power output per FCC §15.407(a) was measured on the EUT using a 50 ohm RF cable connected to spectrum analyzer and the measurement method refer to KDB 789033D02: Method PM.

3.4 Test protocol

Temperature : 25 °C
Relative Humidity : 55 %

EIRP limit calculation for 5.2GHz band:

Frequency range (MHz)	Mode	Min. 99% bandwidth (MHz)	10 + 10log B (dBm)	E.I.R.P. Limit (dBm)
5150 - 5250	802.11a	16.68	22.22	22.22
	802.11n20	17.52	22.44	22.44

Mode	Freq. (MHz)	Reading (dBm)		Total Conducted Power (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
		Chain 1	Chain 2				
802.11a	5180	12.90	-	12.90	17.10	22.22	5.12
	5200	13.00	-	13.00	17.20	22.22	5.02
	5240	13.00	-	13.00	17.20	22.22	5.02
	5745	13.80	-	13.80	/	30.00	16.20
	5785	13.60	-	13.60	/	30.00	16.40
	5825	13.10	-	13.10	/	30.00	16.90
802.11n20	5180	12.70	12.40	15.60	19.80	22.44	2.64
	5200	12.70	12.20	15.50	19.70	22.44	2.74
	5240	12.50	13.00	15.80	20.00	22.44	2.44
	5745	13.00	14.80	17.00	/	30.00	13.00
	5785	12.80	14.40	16.70	/	30.00	13.30
	5825	12.20	13.20	15.70	/	30.00	14.30

Note: The ISSED limit is more stringent than FCC, so this results also compliance to FCC limit.

3.5 Measurement uncertainty

Measurement uncertainty: $\pm 0.74\text{dB}$

The measurement uncertainty is given with a confidence of 95%, $k=2$.

4. Power spectral density

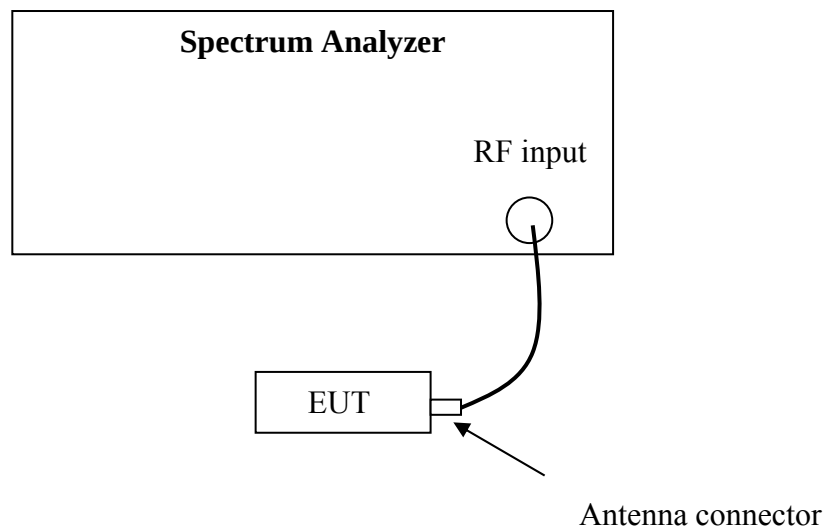
Test result: Pass

4.1 Test limit

- ☐ For outdoor access point operating in 5150-5250MHz: 17dBm/MHz;
- ☐ For indoor access point operating in 5150-5250MHz: 17dBm/MHz;
- ☐ For fixed point-to-point access point operating in 5150-5250MHz: 17dBm/MHz;
- ☒ For device operating in 5150-5250MHz: 10dBm/MHz EIRP;
- ☐ For device operating in 5.25-5.35 GHz and 5.47-5.725 GHz: 11dBm/MHz;
- ☒ For device operating in 5.725-5.85 GHz: 30dBm/500kHz;

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi (For fixed point-to-point access point operating in 5150-5250MHz, replaced with 23dBi).

4.2 Test Configuration



4.3 Test procedure and test setup

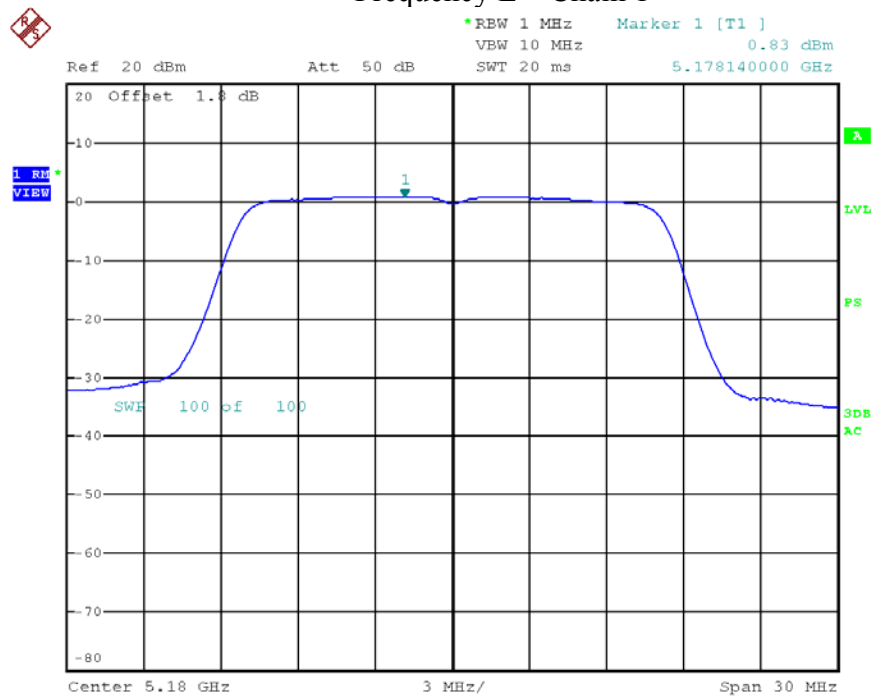
The power spectral density per FCC §15.407(a) was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set at 1MHz, the video bandwidth set >RBW (measurement method refer to KDB 789033D02: section F).

4.4 Test Protocol

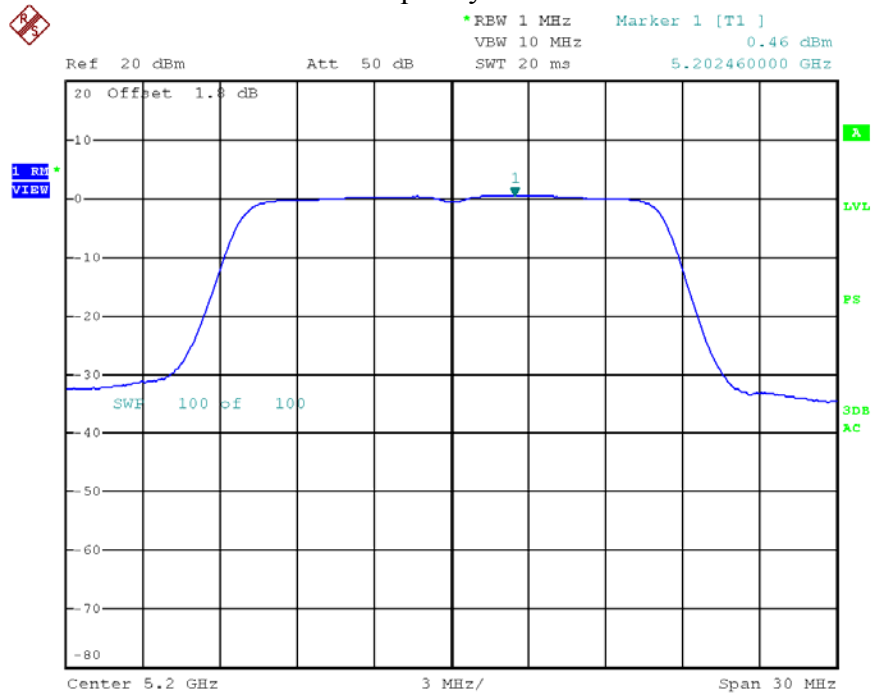
Temperature : 25 °C
Relative Humidity : 55 %

Mode	Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Gain (dBi)	EIRP PSD Reading (dBm/MHz)	EIRP PSD Limit (dBm/MHz)
		Chain 1	Chain 2				
802.11a	5180	0.83	-	0.83	4.20	5.03	10.00
	5200	0.46	-	0.46	4.20	4.66	10.00
	5240	-0.22	-	-0.22	4.20	3.98	10.00

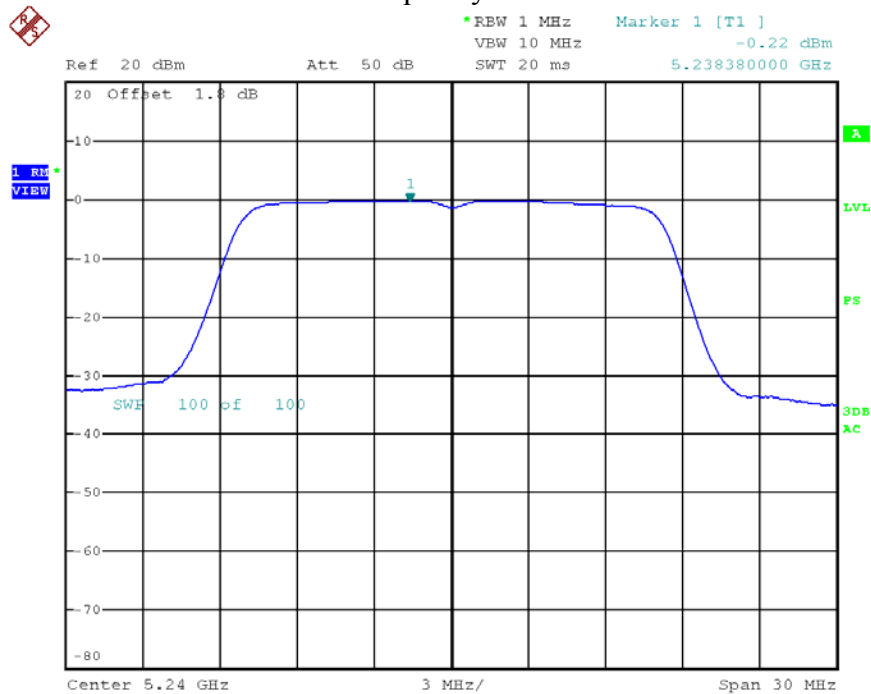
Frequency L – Chain 1



Frequency M – Chain 1

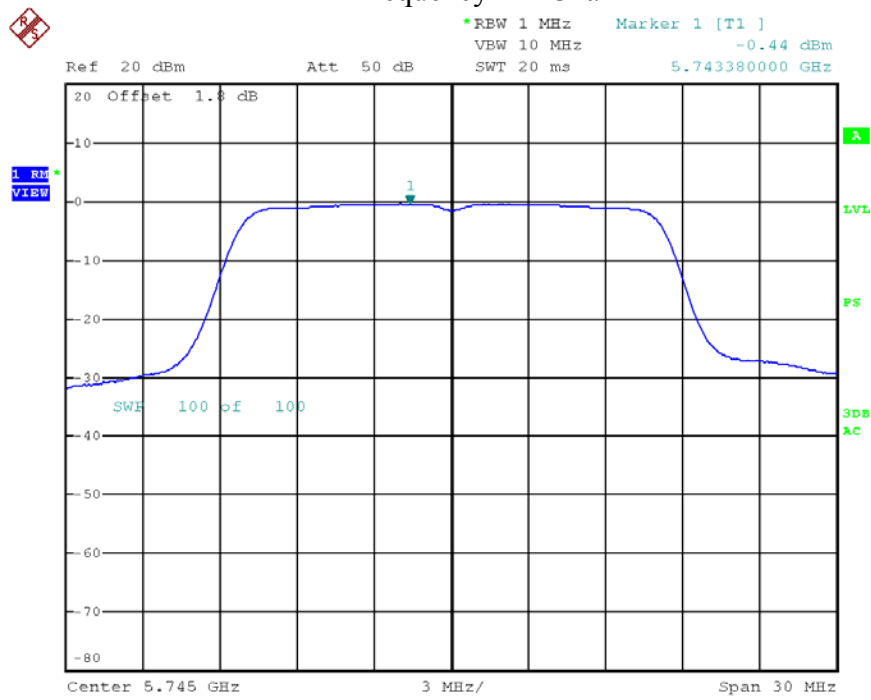


Frequency H – Chain 1

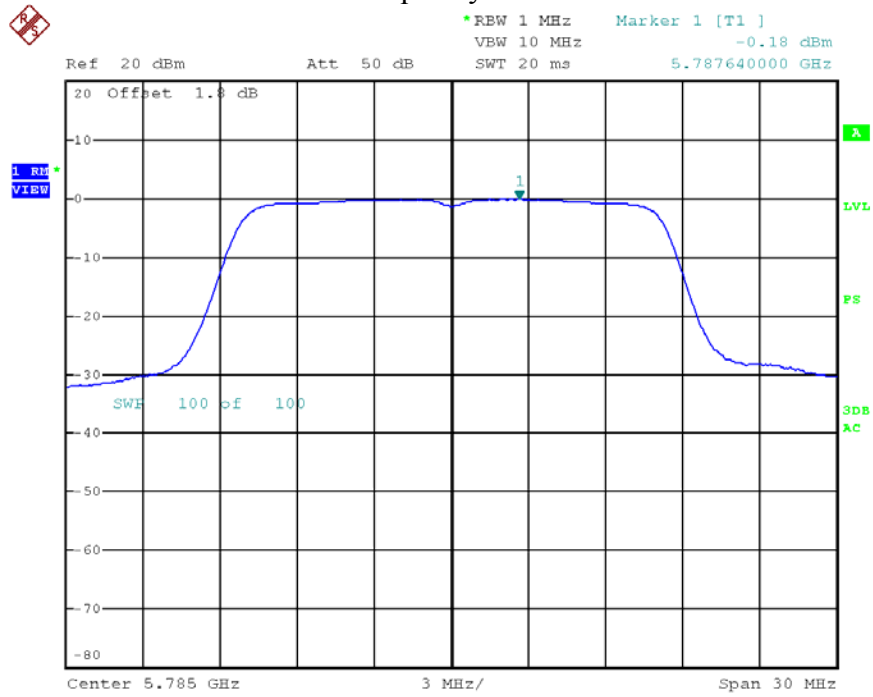


Mode	Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Limit (dBm/500kHz)
		Chain 1	Chain 2		
802.11a	5745	-0.44	-	-0.44	30.00
	5785	-0.18	-	-0.18	30.00
	5825	0.49	-	0.49	30.00

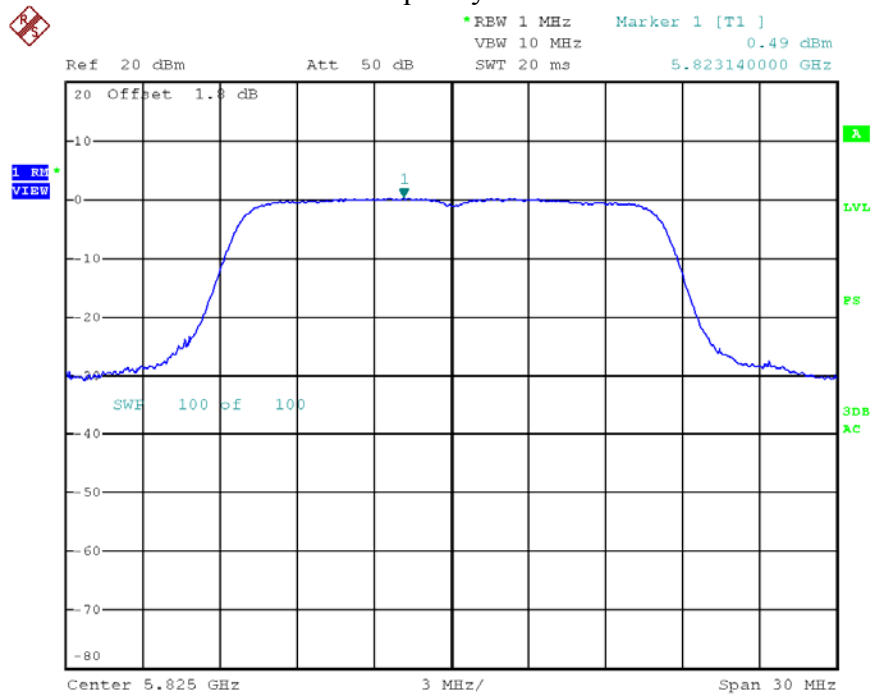
Frequency L – Chain 1



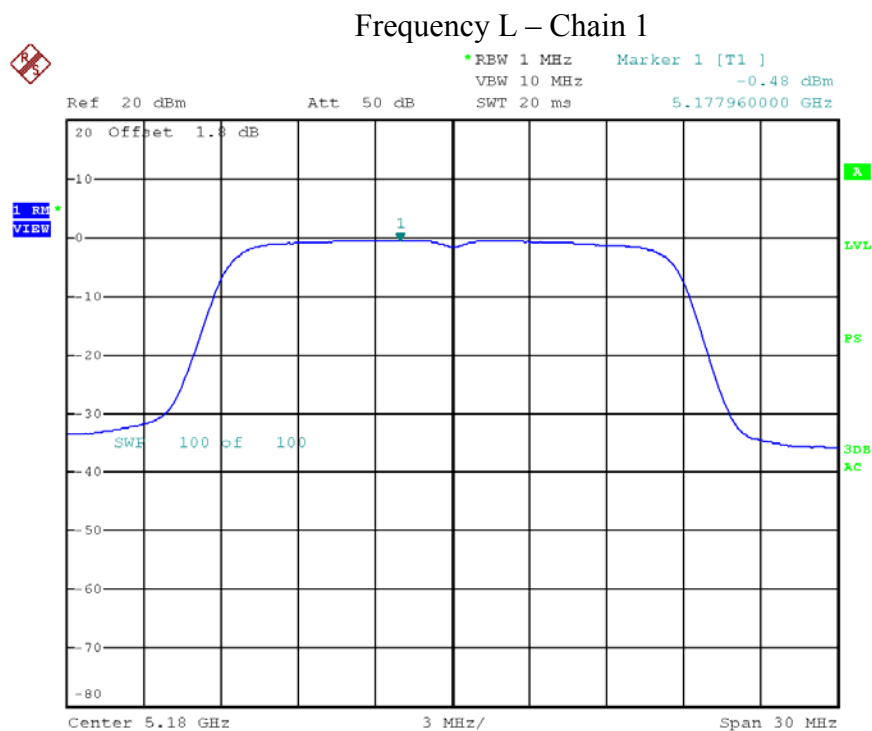
Frequency M – Chain 1



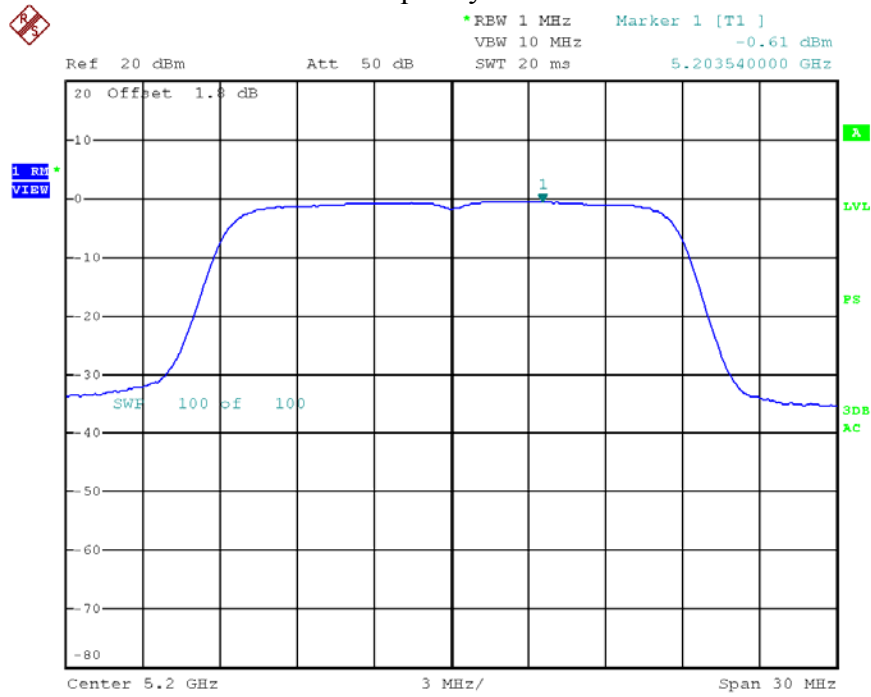
Frequency H – Chain 1



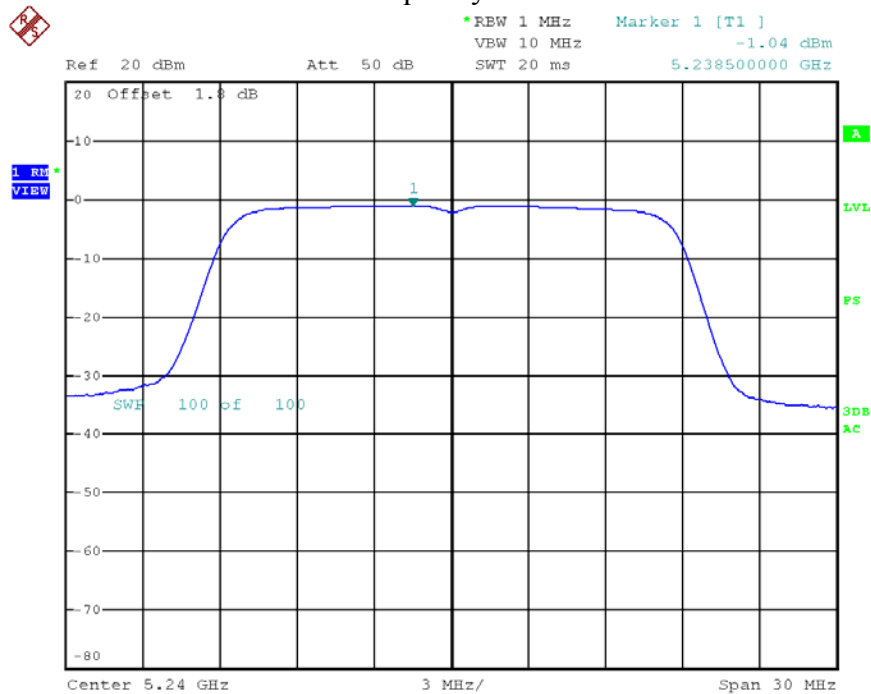
Mode	Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Gain (dBi)	EIRP PSD Reading (dBm/MHz)	EIRP PSD Limit (dBm/MHz)
		Chain 1	Chain 2				
802.11n20	5180	-0.48	1.16	3.43	4.20	7.63	10.00
	5200	-0.61	0.66	3.08	4.20	7.28	10.00
	5240	-1.04	-0.44	2.28	4.20	6.48	10.00



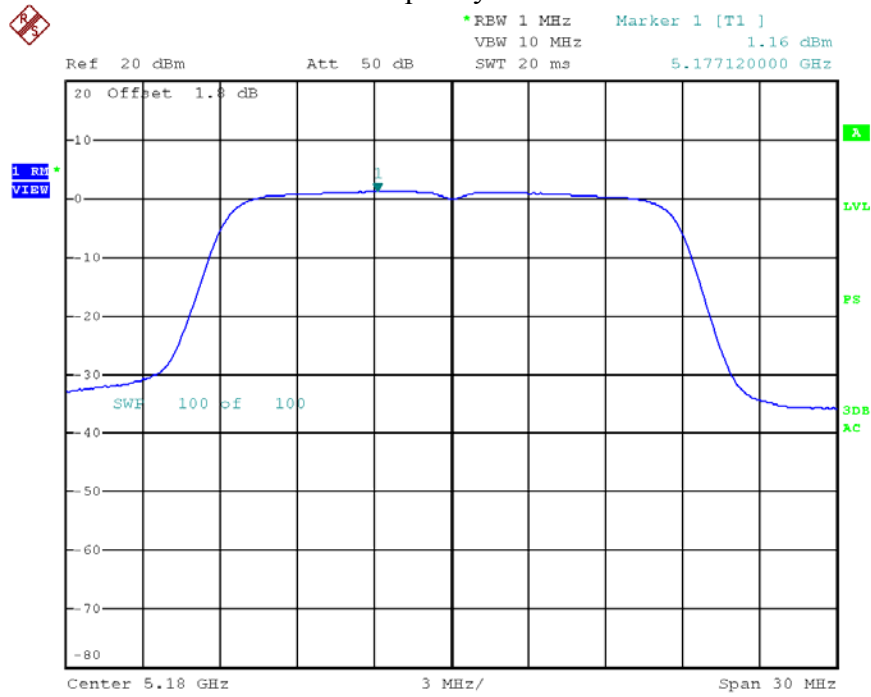
Frequency M – Chain 1



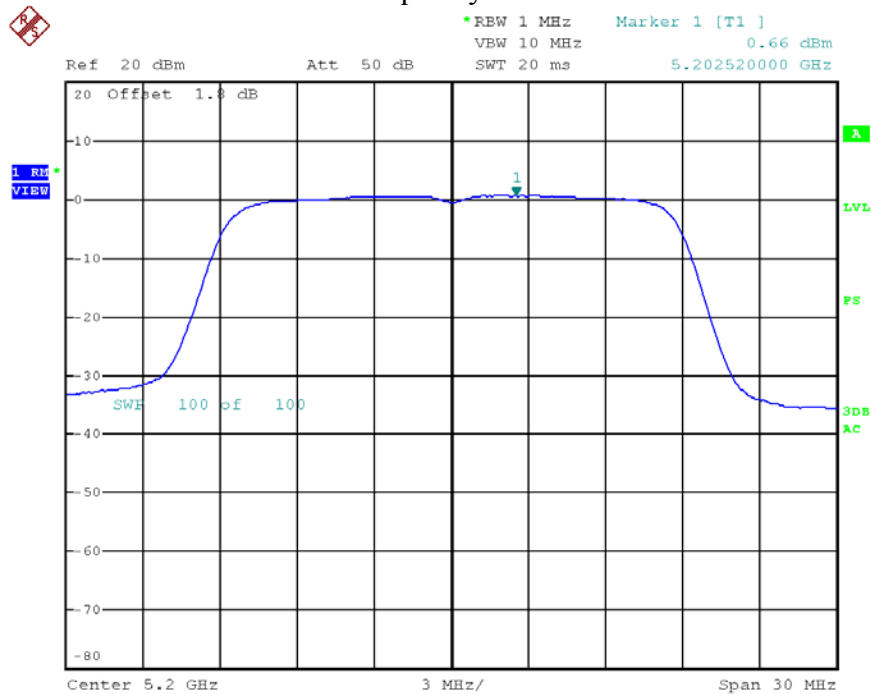
Frequency H – Chain 1



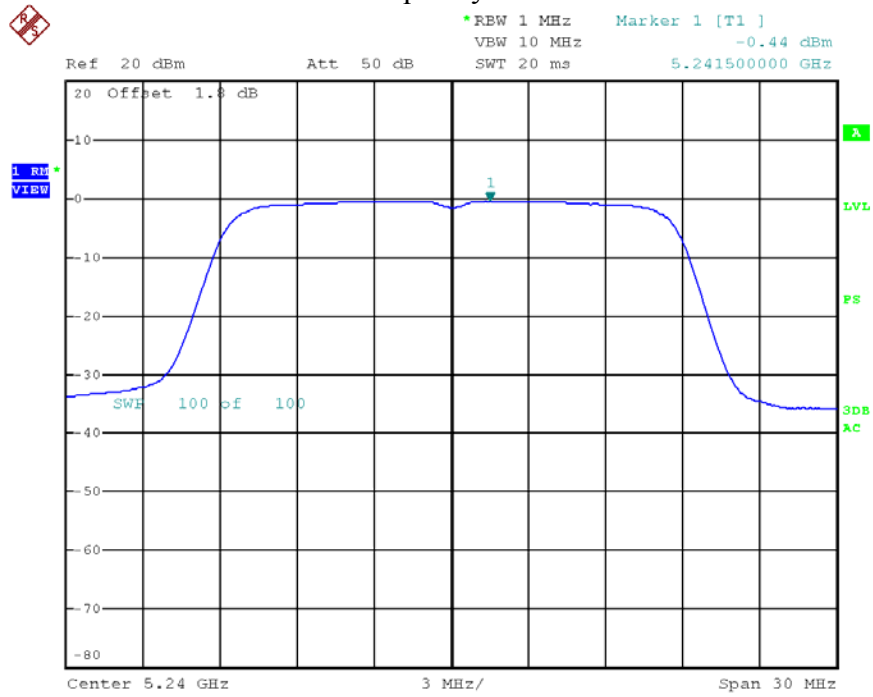
Frequency L – Chain 2



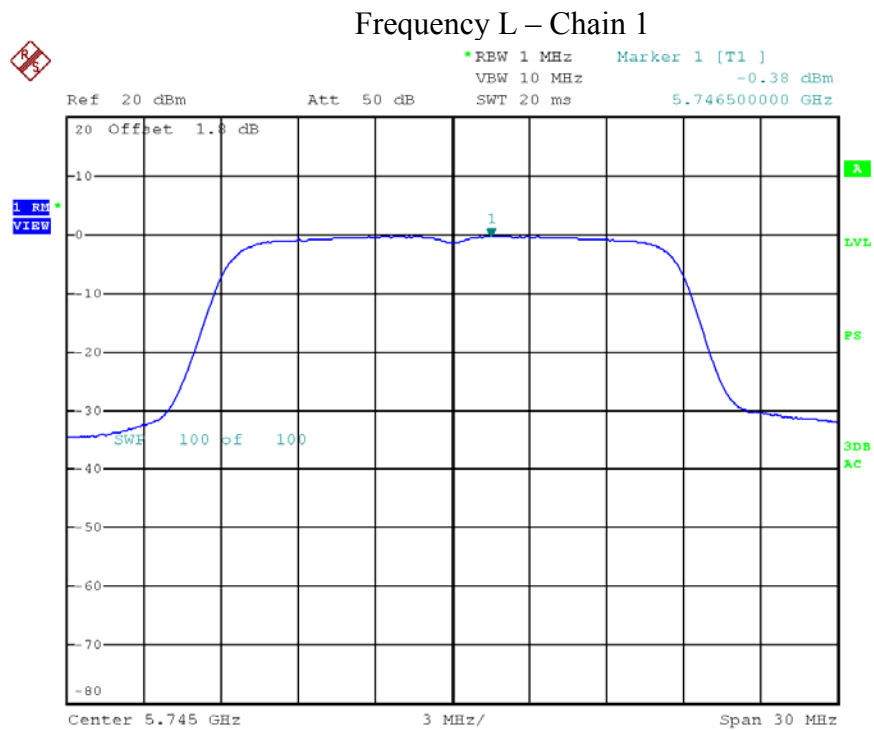
Frequency M – Chain 2



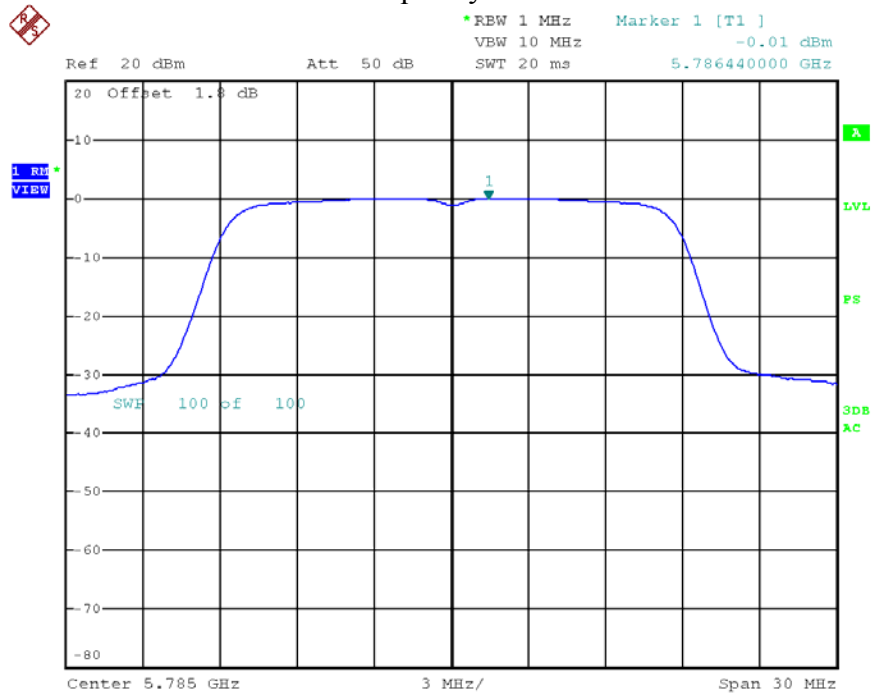
Frequency H – Chain 2



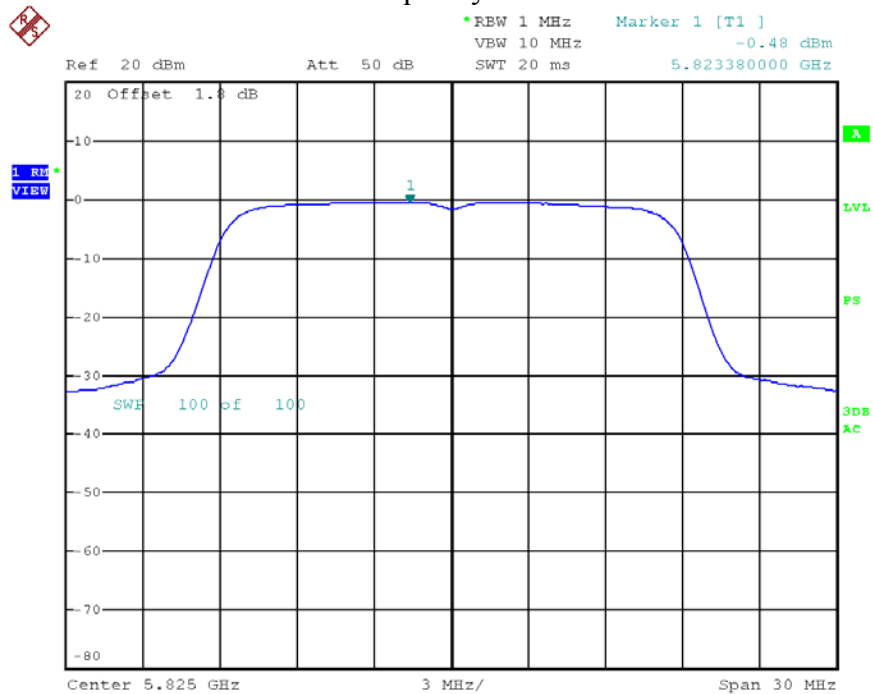
Mode	Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Limit (dBm/500kHz)
		Chain 1	Chain 2		
802.11n20	5745	-0.38	2.73	4.46	30.00
	5785	-0.01	1.66	3.92	30.00
	5825	-0.48	1.23	3.47	30.00



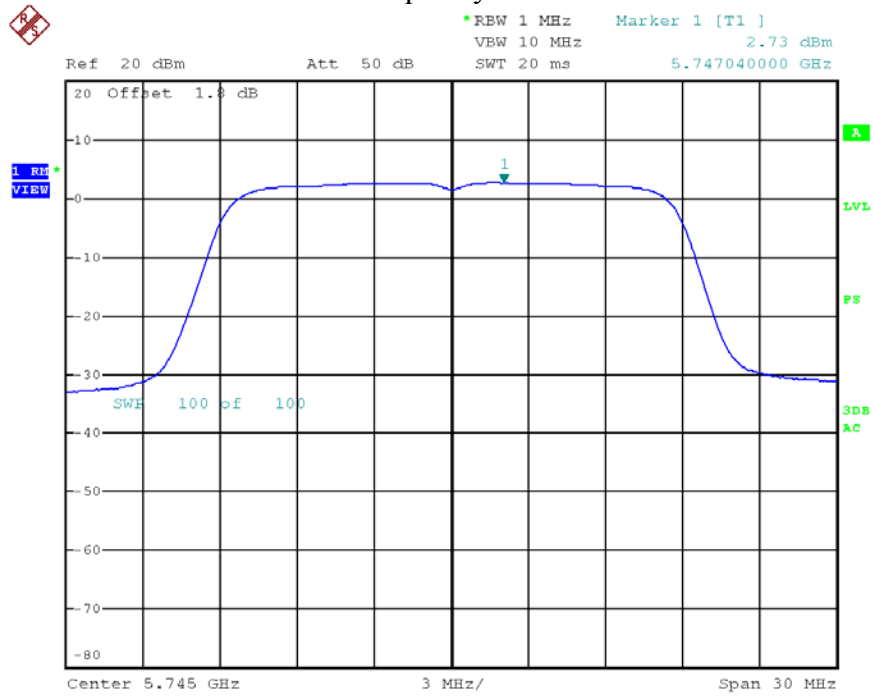
Frequency M – Chain 1



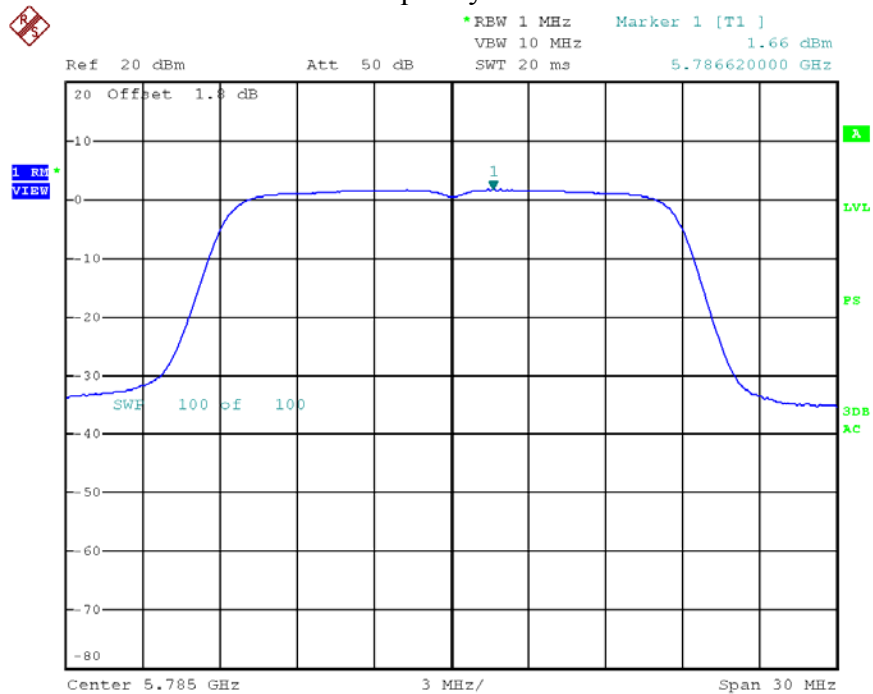
Frequency H – Chain 1



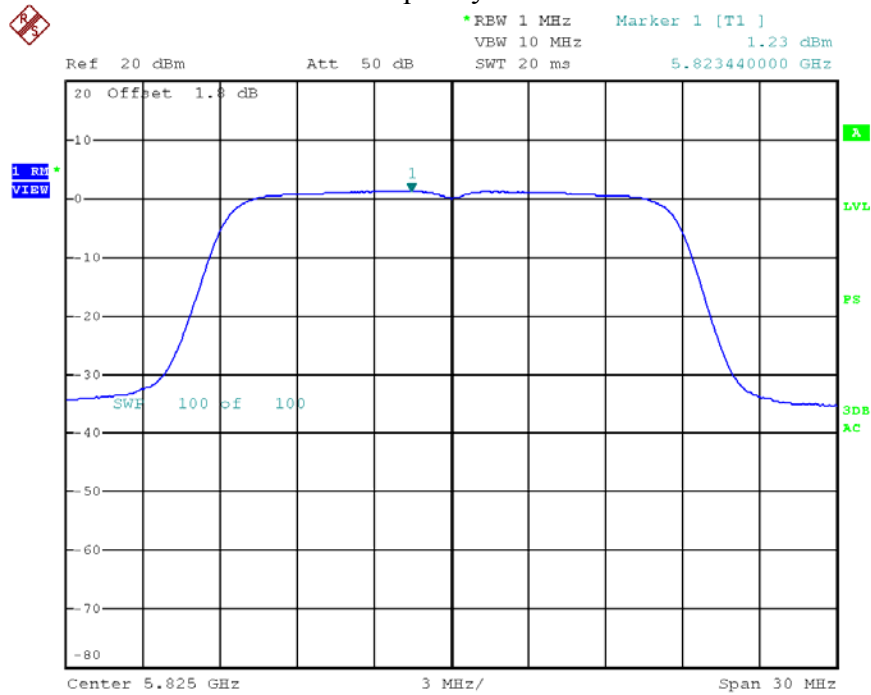
Frequency L – Chain 2



Frequency M – Chain 2



Frequency H – Chain 2



4.5 Measurement uncertainty

Measurement uncertainty: $\pm 0.74\text{dB}$

The measurement uncertainty is given with a confidence of 95%, $k=2$.

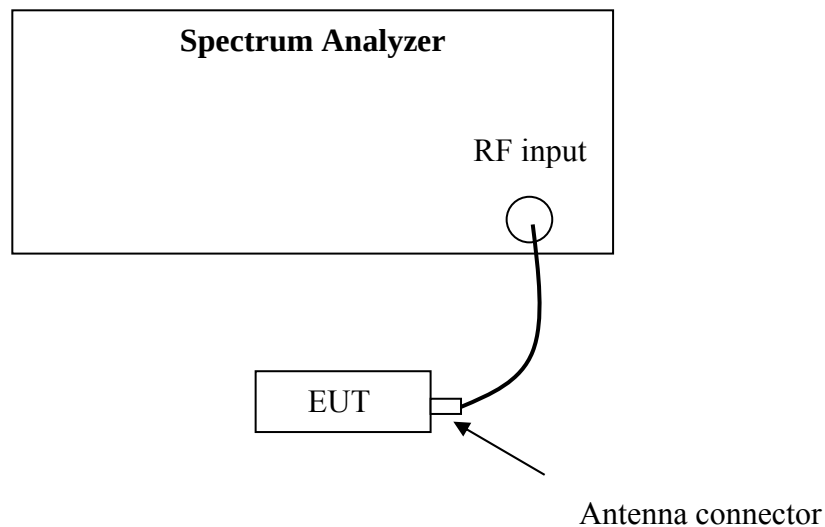
5. Minimum 6dB Bandwidth

Test result: PASS

5.1 Limit

For systems using digital modulation techniques that may operate in the 5725 - 5850 MHz band, the minimum 6 dB bandwidth shall be at least 500 kHz.

5.2 Test Configuration



5.3 Test Procedure and test setup

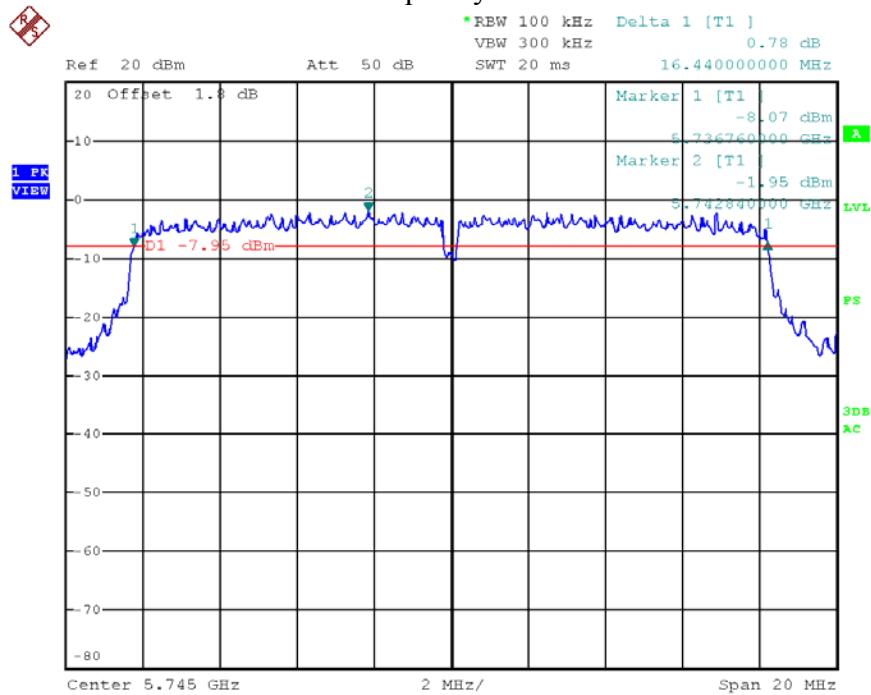
The power spectrum density per FCC §15.407(a)(6) was measured from the antenna port of the EUT. Using a 50ohm spectrum analyzer (measurement method refers to KDB 789033D02: Section C).

5.4 Test Protocol

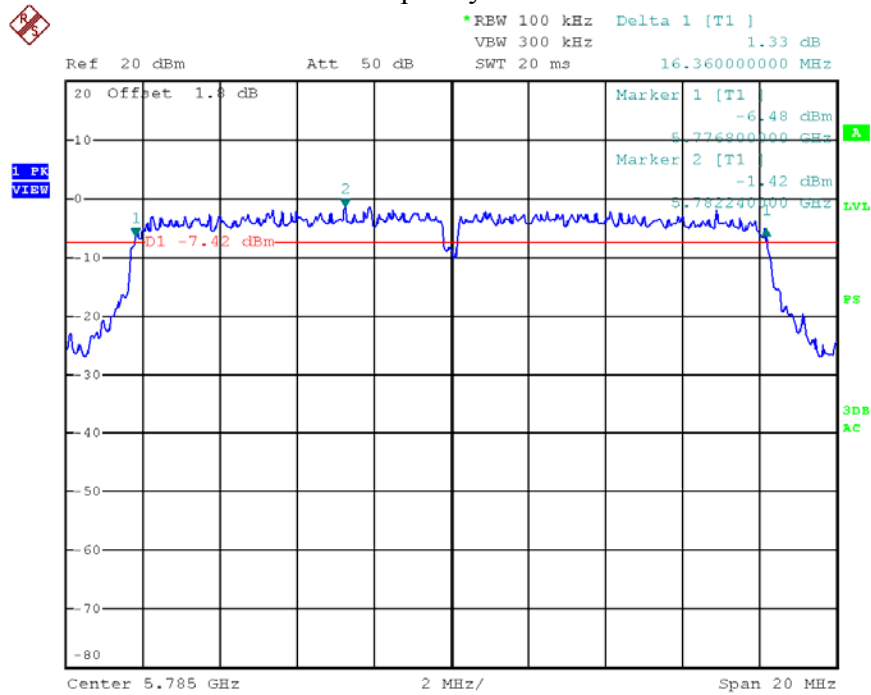
Temperature : 25 °C
Relative Humidity : 55 %

Mode	Freq. (MHz)	Chain 1 (MHz)	Chain 2 (MHz)	Limit (MHz)
802.11a	5745	16.44	-	≥0.5
	5785	16.36	-	
	5825	16.36	-	

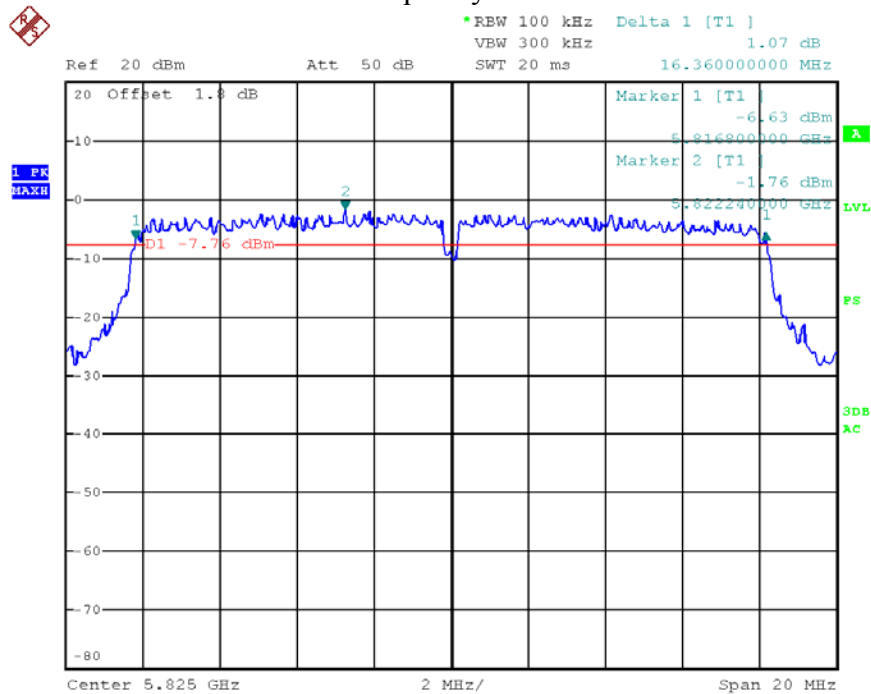
Frequency L – Chain 1



Frequency M – Chain 1

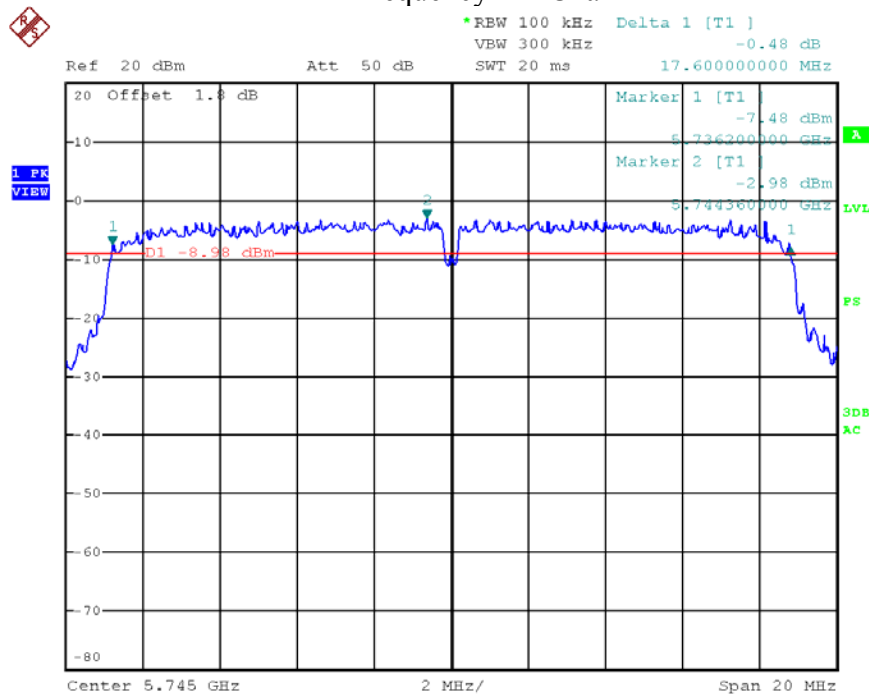


Frequency H – Chain 1

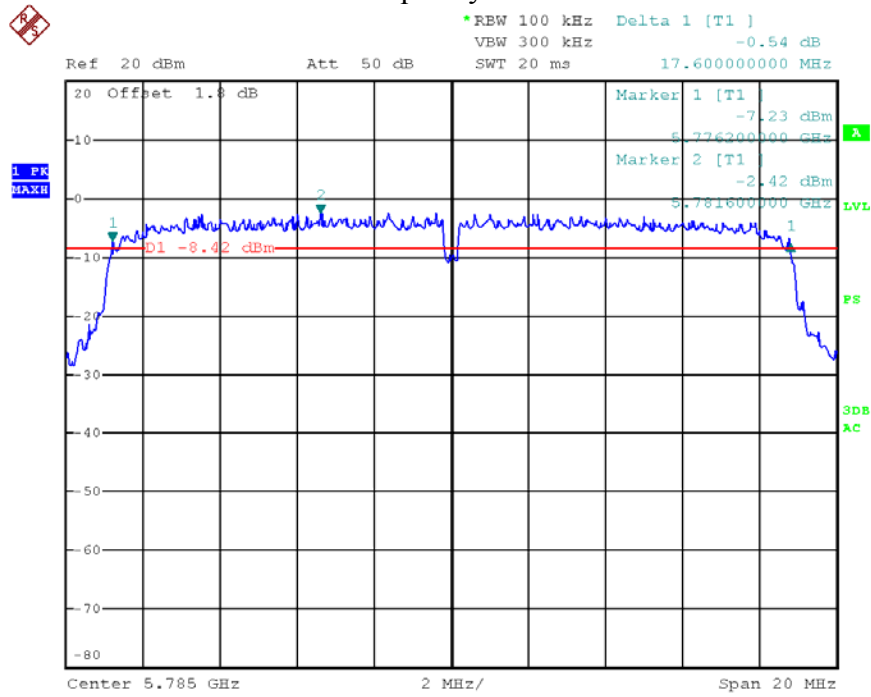


Mode	Freq. (MHz)	Chain 1 (MHz)	Chain 2 (MHz)	Limit (MHz)
802.11n20	5745	17.60	16.96	≥ 0.5
	5785	17.60	17.52	
	5825	17.56	16.92	

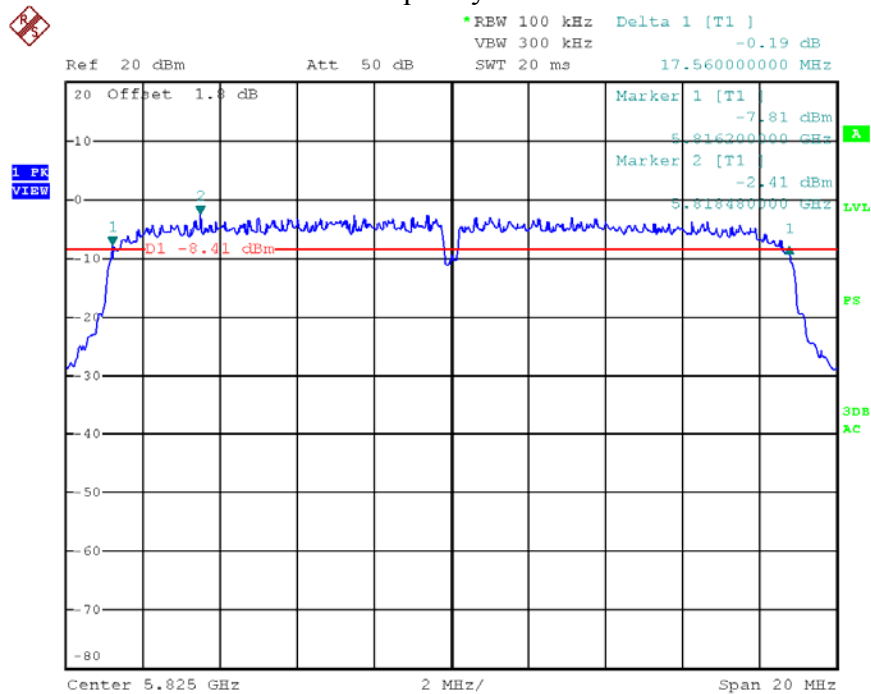
Frequency L – Chain 1



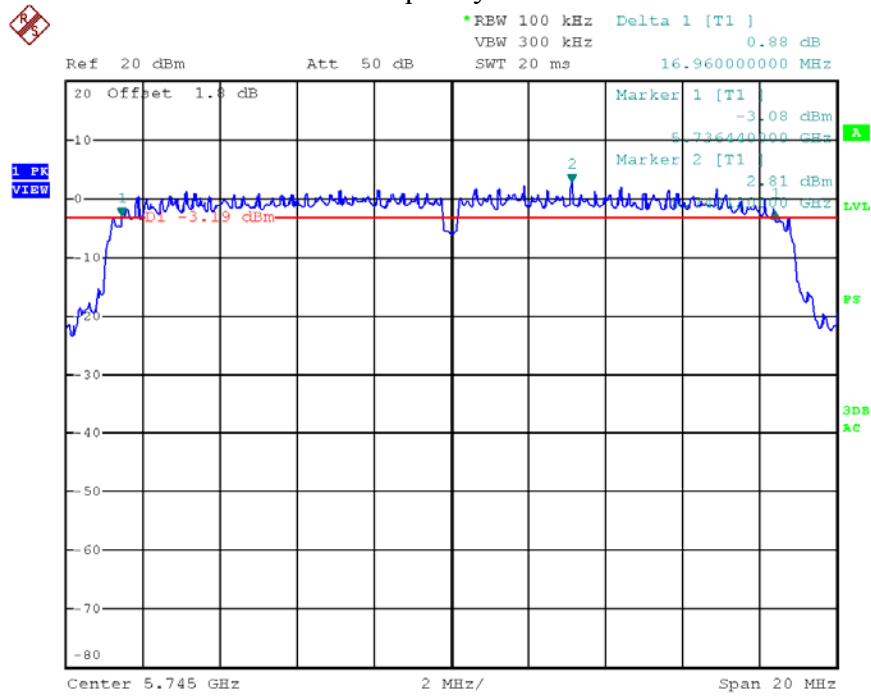
Frequency M – Chain 1



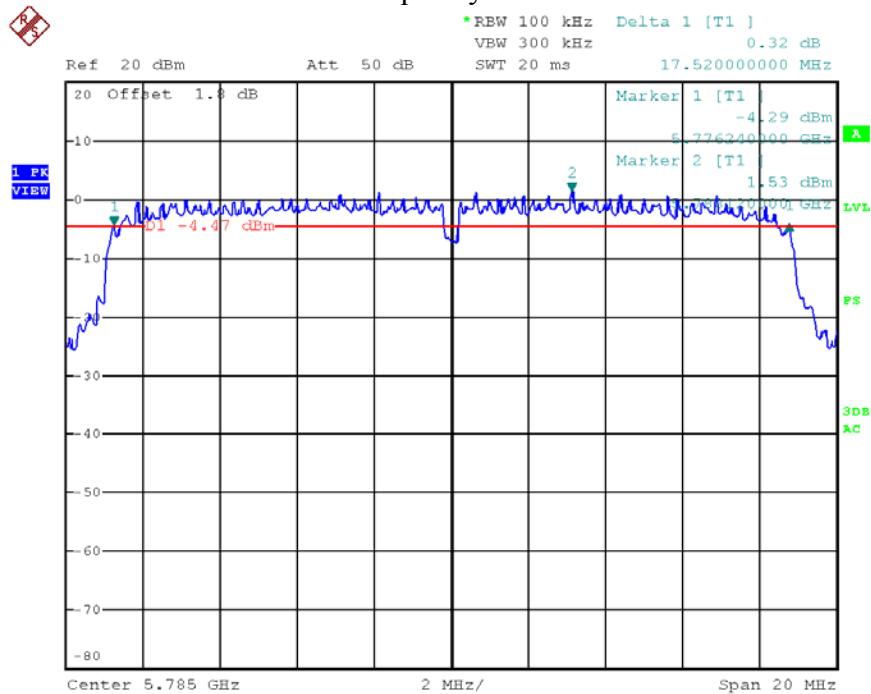
Frequency H – Chain 1



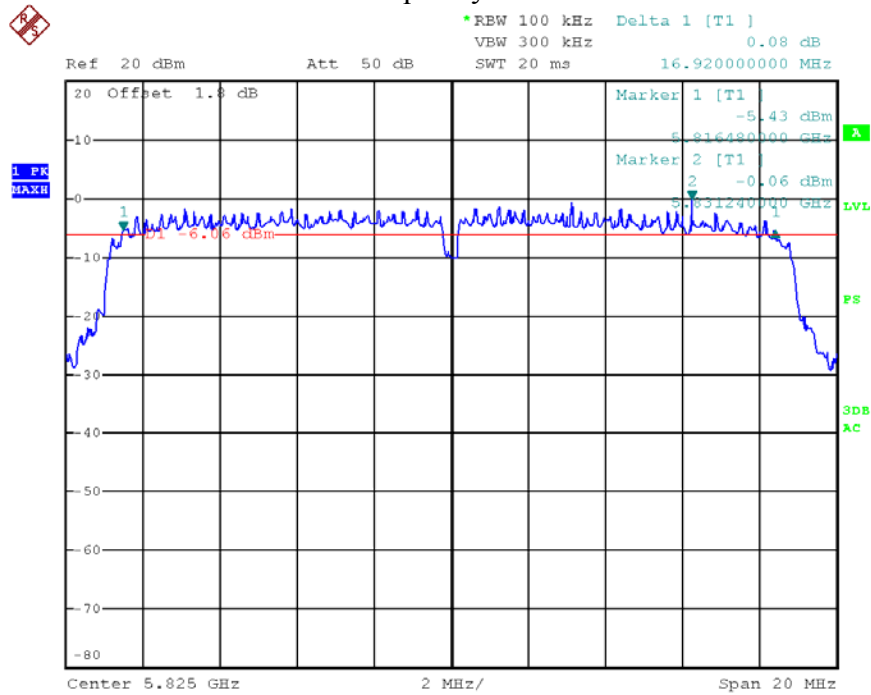
Frequency L – Chain 2



Frequency M – Chain 2



Frequency H – Chain 2



5.5 Measurement uncertainty

Measurement uncertainty: $\pm 3 \%$

The measurement uncertainty is given with a confidence of 95%, $k=2$.

6. Radiated emission

Test result: PASS

6.1 Test limit

6.1.1 The radiated emissions which are lower than 1GHz or fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) showed as below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

6.1.2 The emission which is outside the restrict bands, should comply with the EIRP limit as below:

☐ For transmitters operating in the 5.15–5.25 / 5.25 – 5.35 / 5.47 – 5.725 GHz band: all emissions outside of the 5.15–5.25 / 5.25 – 5.35 / 5.47 – 5.725 GHz band shall not exceed an EIRP of -27dBm/MHz with RSS 247 6.2.

EIRP Limit (dBm)	Equivalent Field Strength (3m) (dBuV/m)
-27	68.20

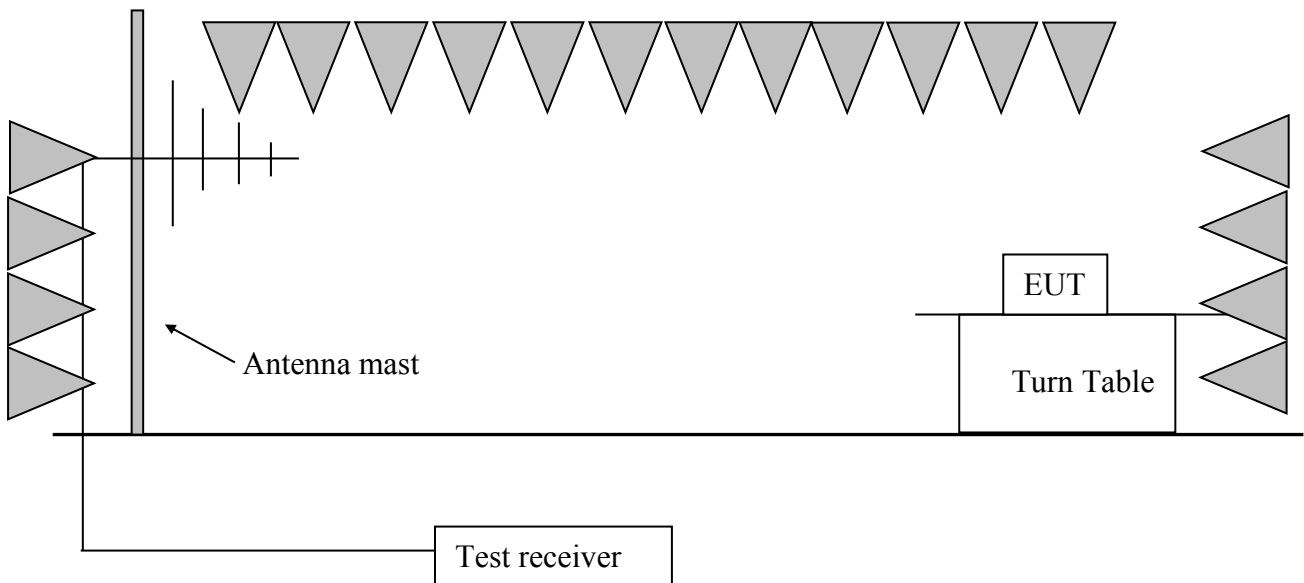
☐ For transmitters operating in the 5.725 – 5.85GHz band: emission among 5.715 – 5.725GHz & 5.85 – 5.86GHz shall not exceed an EIRP of -17dBm/MHz all emissions outside band shall not exceed an EIRP of -27dBm/MHz with RSS 247 6.2.

EIRP Limit (dBm)	Equivalent Field Strength (3m) (dBuV/m)
-27	68.20
-17	78.20

☒ Assessed with 15.209(a):

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

6.2 Test Configuration



6.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.

The EUT and simulators were placed on a 0.8m high wooden turntable above the horizontal metal ground plane. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

The EUT was tested according to KDB 789033D02: Section G.

The radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

RBW = 100kHz, VBW = 300kHz (30MHz~1GHz)

RBW = 1MHz, VBW = 3MHz (>1GHz for PK);

RBW = 1MHz, VBW = 10Hz (>1GHz for AV);

6.4 Test protocol

Temperature : 25 °C
Relative Humidity : 55 %

Mode 802.11a

CH (MHz)	Antenna	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
5180	H	5178.15	42.80	98.10	/	/	PK
	V	55.27	8.30	34.80	40.00	5.20	PK
	H	319.64	16.10	45.00	46.00	1.00	PK
	V	589.84	21.60	41.50	46.00	4.50	PK
	H	5150.00	43.70	62.90	74.00	11.10	PK
	H	5150.00	43.70	48.40	54.00	5.60	AV
	V	10344.68	6.10	51.50	54.00	2.50	PK
	V	15635.27	10.50	48.70	54.00	5.30	PK
5200	H	5203.62	42.90	98.30	/	/	PK
	V	55.27	8.30	34.80	40.00	5.20	PK
	H	319.64	16.10	45.00	46.00	1.00	PK
	V	589.84	21.60	41.50	46.00	4.50	PK
	H	5150.00	43.70	62.80	74.00	11.20	PK
	H	5150.00	43.70	48.20	54.00	5.80	AV
	V	10384.76	6.20	52.20	54.00	1.80	PK
	V	13791.58	10.20	47.10	54.00	6.90	PK
5240	H	5240.30	43.00	98.40	/	/	PK
	V	55.27	8.30	34.80	40.00	5.20	PK
	H	319.64	16.10	45.00	46.00	1.00	PK
	V	589.84	21.60	41.50	46.00	4.50	PK
	H	5250.00	43.00	71.00	74.00	3.00	PK
	H	5250.00	43.00	51.50	54.00	2.50	AV
	V	10484.96	6.50	53.70	74.00	20.30	PK
	V	10484.96	6.50	43.10	54.00	10.90	AV
	V	16597.19	11.60	48.60	54.00	5.40	PK

CH (MHz)	Antenna	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
5745	H	5746.09	43.90	104.00	/	/	PK
	V	55.27	8.30	34.80	40.00	5.20	PK
	H	319.64	16.10	45.00	46.00	1.00	PK
	V	589.84	21.60	41.50	46.00	4.50	PK
	H	5460.00	-2.10	41.70	54.00	12.30	PK
	V	11486.97	7.40	60.60	74.00	13.40	PK
	V	11486.97	7.40	50.00	54.00	4.00	AV
	V	17238.47	12.40	54.30	74.00	19.70	PK
	V	17238.47	12.40	44.80	54.00	8.80	AV
5785	H	5786.45	43.90	104.10	/	/	PK
	V	55.27	8.30	34.80	40.00	5.20	PK
	H	319.64	16.10	45.00	46.00	1.00	PK
	V	589.84	21.60	41.50	46.00	4.50	PK
	H	5460.00	-2.10	41.20	54.00	12.80	PK
	V	11567.13	7.40	54.60	74.00	19.40	PK
	V	11567.13	7.40	45.10	54.00	8.90	AV
	V	17353.18	12.60	53.50	74.00	20.50	PK
	V	17353.18	12.60	43.70	54.00	10.30	AV
5825	H	5822.24	44.00	104.40	/	/	PK
	V	55.27	8.30	34.80	40.00	5.20	PK
	H	319.64	16.10	45.00	46.00	1.00	PK
	V	589.84	21.60	41.50	46.00	4.50	PK
	H	7250.00	2.40	45.00	54.00	9.00	PK
	V	11647.29	7.30	54.10	74.00	19.90	PK
	V	11647.29	7.30	44.40	54.00	9.60	AV
	V	17472.33	13.10	52.40	74.00	21.60	PK
	V	17472.33	13.10	42.00	54.00	12.00	AV

Mode 802.11 n20

CH (MHz)	Antenna	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
5180	H	5182.36	42.80	100.90	/	/	PK
	V	55.27	8.30	34.80	40.00	5.20	PK
	H	319.64	16.10	45.00	46.00	1.00	PK
	V	589.84	21.60	41.50	46.00	4.50	PK
	H	5150.00	43.70	63.20	74.00	10.80	PK
	H	5150.00	43.70	48.50	54.00	5.50	AV
	V	10344.68	6.10	51.80	54.00	2.20	PK
	V	15635.27	10.50	49.00	54.00	5.00	PK
5200	H	5202.19	42.90	100.70	/	/	PK
	V	55.27	8.30	34.80	40.00	5.20	PK
	H	319.64	16.10	45.00	46.00	1.00	PK
	V	589.84	21.60	41.50	46.00	4.50	PK
	H	5150.00	43.70	62.80	74.00	11.20	PK
	H	5150.00	43.70	48.20	54.00	5.80	AV
	V	10384.76	6.20	52.60	54.00	1.40	PK
	V	13791.58	10.20	47.60	54.00	6.40	PK
5240	H	5242.63	43.00	100.30	/	/	PK
	V	55.27	8.30	34.80	40.00	5.20	PK
	H	319.64	16.10	45.00	46.00	1.00	PK
	V	589.84	21.60	41.50	46.00	4.50	PK
	H	5250.00	43.00	72.10	74.00	1.90	PK
	H	5250.00	43.00	52.60	54.00	1.40	AV
	V	10484.96	6.50	54.20	74.00	19.80	PK
	V	10484.96	6.50	43.50	54.00	10.50	AV
	V	16597.19	11.60	48.80	54.00	5.20	PK

CH (MHz)	Antenna	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
5745	H	5743.28	43.90	105.80	/	/	PK
	V	55.27	8.30	34.80	40.00	5.20	PK
	H	319.64	16.10	45.00	46.00	1.00	PK
	V	589.84	21.60	41.50	46.00	4.50	PK
	H	5460.00	-2.10	41.90	54.00	12.10	PK
	V	11486.97	7.40	62.50	74.00	11.50	PK
	V	11486.97	7.40	48.20	54.00	5.80	AV
	V	17238.47	12.40	55.60	74.00	18.40	PK
	V	17238.47	12.40	41.00	54.00	13.00	AV
5785	H	5784.39	43.90	105.30	/	/	PK
	V	55.27	8.30	34.80	40.00	5.20	PK
	H	319.64	16.10	45.00	46.00	1.00	PK
	V	589.84	21.60	41.50	46.00	4.50	PK
	H	5460.00	-2.10	41.60	54.00	12.40	PK
	V	11567.13	7.40	55.90	74.00	18.10	PK
	V	11567.13	7.40	41.30	54.00	12.70	AV
	V	17353.18	12.60	54.70	74.00	19.30	PK
	V	17353.18	12.60	40.10	54.00	13.90	AV
5825	H	5822.24	44.00	105.10	/	/	PK
	V	55.27	8.30	34.80	40.00	5.20	PK
	H	319.64	16.10	45.00	46.00	1.00	PK
	V	589.84	21.60	41.50	46.00	4.50	PK
	H	7250.00	2.40	45.30	54.00	8.70	PK
	V	11647.29	7.30	55.50	74.00	18.50	PK
	V	11647.29	7.30	41.60	54.00	12.40	AV
	V	17472.33	13.10	52.30	74.00	21.70	PK
	V	17472.33	13.10	38.40	54.00	15.60	AV

- Remark: 1. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
2. Corrected Reading = Original Receiver Reading + Correct Factor
3. Margin = limit – Corrected Reading

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Original Receiver Reading = 10dBuV.
Then Correct Factor = 30.20 + 2.00 = 32.20dB/m; Corrected Reading = 10dBuV +
32.20dB/m = 42.20dBuV/m
Assuming limit = 54dBuV/m, Corrected Reading = 42.20dBuV/m, then Margin =
54 - 42.20 = 11.80dBuV/m

6.5 Measurement uncertainty

Measurement uncertainty of radiated emission (30MHz-1000MHz) is: $\pm 4.90\text{dB}$

Measurement uncertainty of radiated emission (1000MHz-6000MHz) is: $\pm 5.02\text{dB}$

The measurement uncertainty is given with a confidence of 95%, $k=2$.

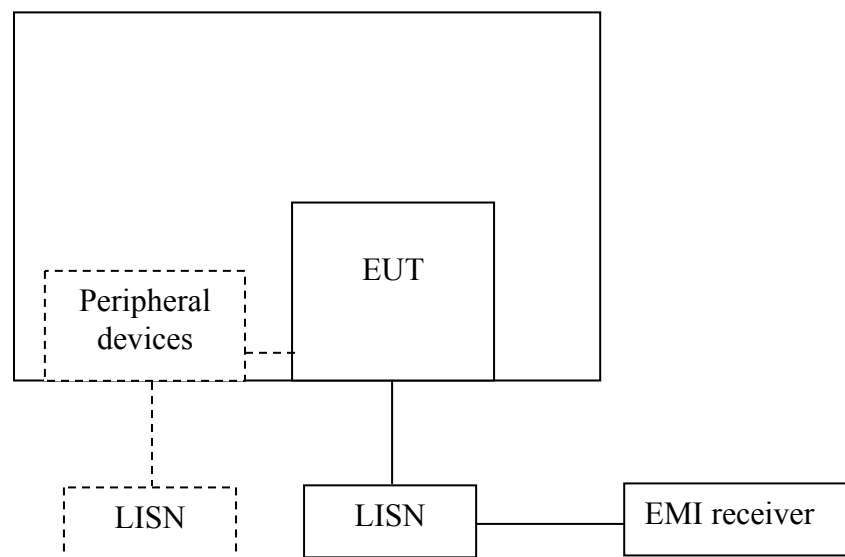
7. Power line conducted emission

Test result: **Pass**

7.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
0.15-0.5	66 to 56*	56 to 46 *
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

7.2 Test configuration



☒ For table top equipment, wooden support is 0.8m height table

☐ For floor standing equipment, wooden support is 0.1m height rack.

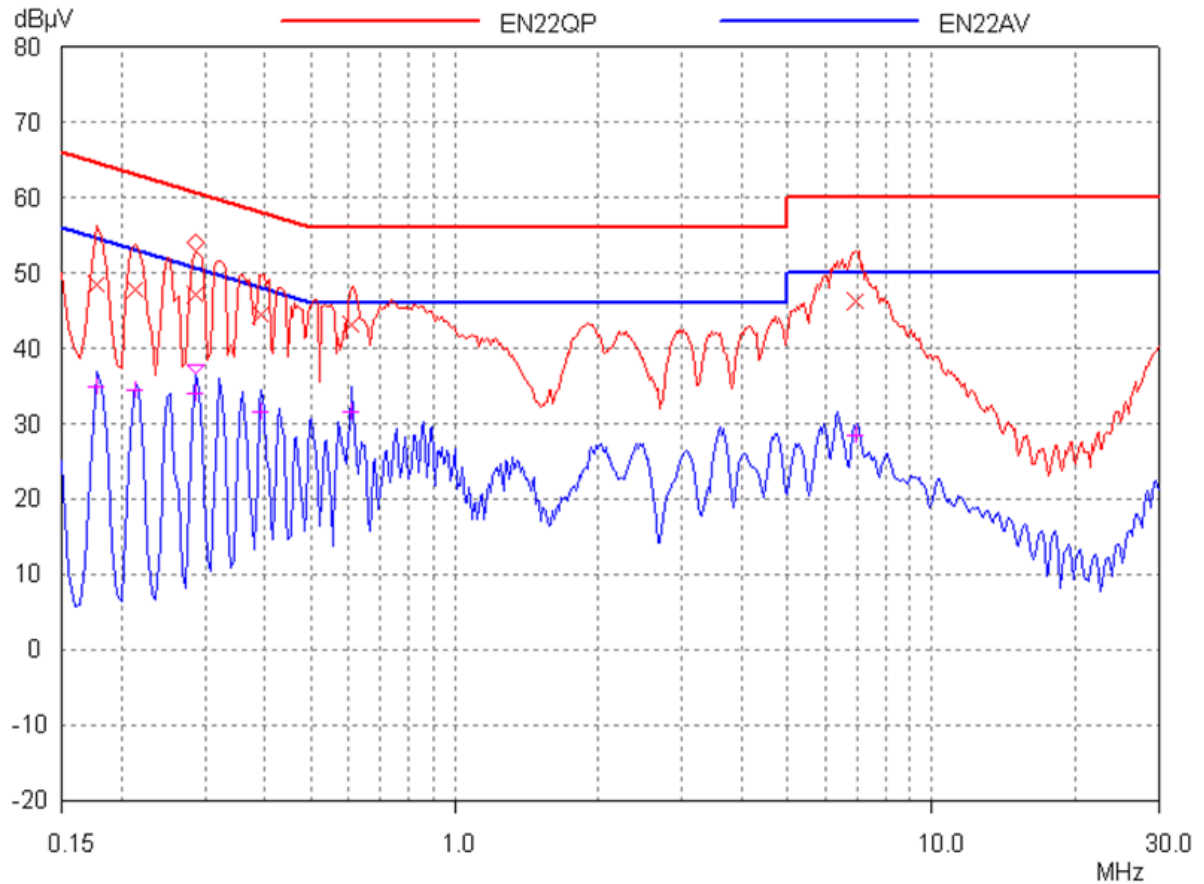
7.3 Test procedure and test set up

The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a $50\Omega/50\mu\text{H}$ coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a $50\Omega/50\mu\text{H}$ coupling impedance with 50Ω termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4 on conducted measurement. The bandwidth of the test receiver is set at 9 kHz.

7.4 Test protocol

Temperature : 25 °C
Relative Humidity : 55 %



Frequency	Correct Factor (dB)	Corrected Reading (dBuV)		Limit (dBuV)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.18 (L)	3.00	48.42	34.97	64.63	54.63	16.21	19.66
0.21 (N)	3.00	47.79	34.42	63.09	53.09	15.30	18.67
0.29 (L)	3.00	47.05	34.11	60.67	50.67	13.62	16.56
0.39 (L)	3.00	44.41	31.51	58.00	48.00	13.59	16.49
0.61 (N)	3.00	43.19	31.49	56.00	46.00	12.81	14.51
6.92 (L)	3.00	46.16	28.48	60.00	50.00	13.84	21.52
Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB). 2. Margin (dB) = Limit - Corrected Reading.							

7.5 Measurement uncertainty

Measurement uncertainty: $\pm 3.19\text{dB}$

The measurement uncertainty is given with a confidence of 95%, $k=2$.

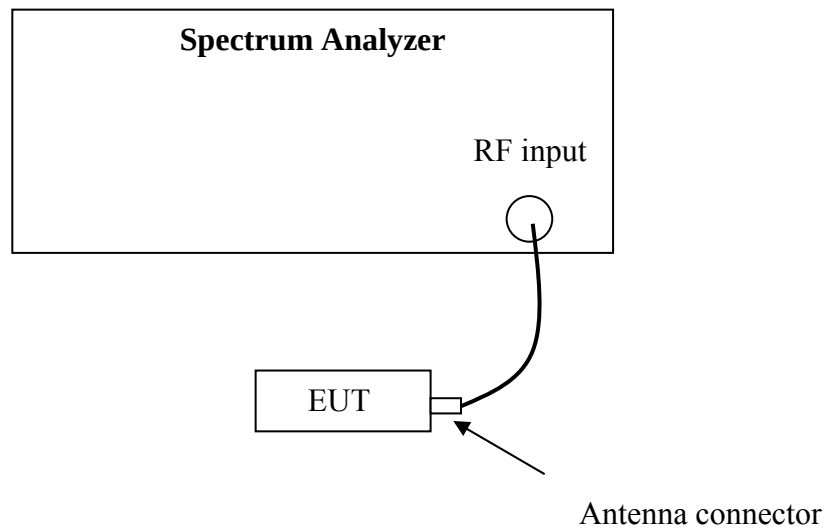
8. 26 dB Bandwidth

Test Status: Tested

8.1 Test limit

None

8.2 Test Configuration



8.3 Test procedure and test setup

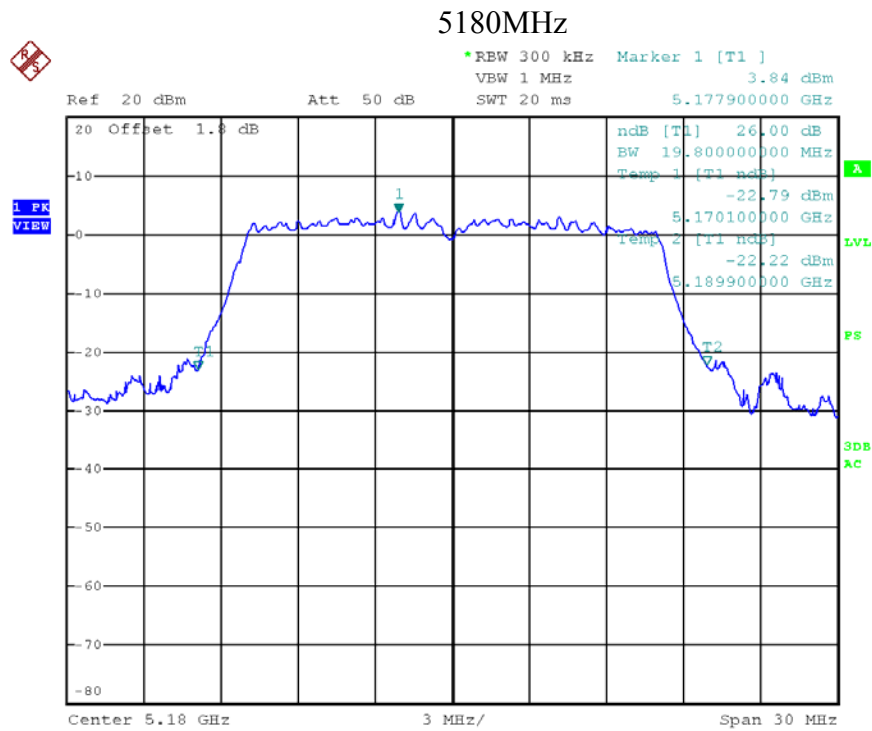
For 26dB bandwidth test:

The measurement methods refer to KDB 789033D02: section C.

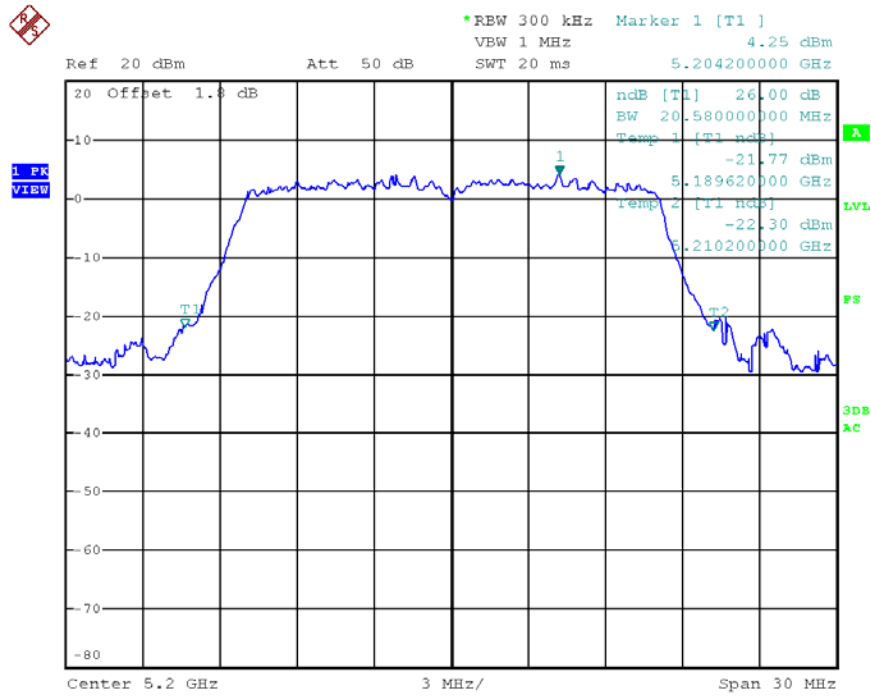
8.4 Test protocol

Temperature : 25 °C
Relative Humidity : 55 %

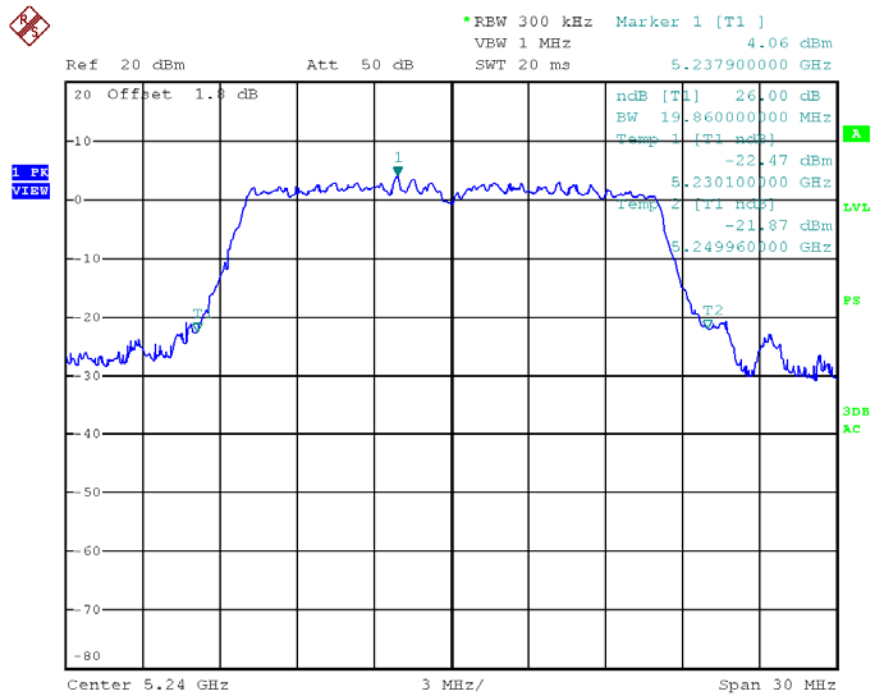
Mode	Frequency (MHz)	26 dB Bandwidth (MHz)
802.11a	5180	19.80
	5200	20.58
	5240	19.86
	5745	22.32
	5785	21.96
	5825	20.40



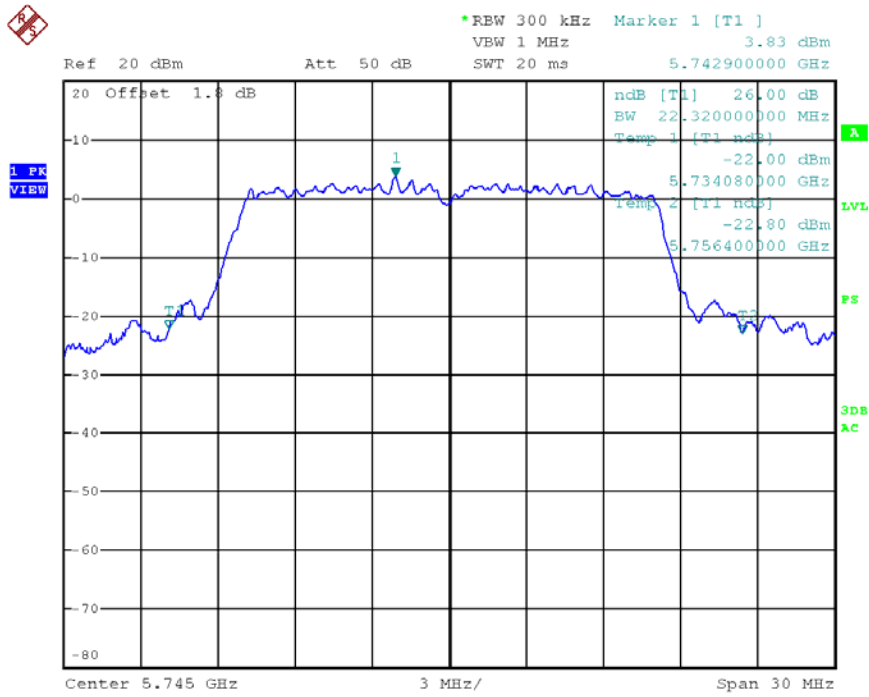
5200MHz



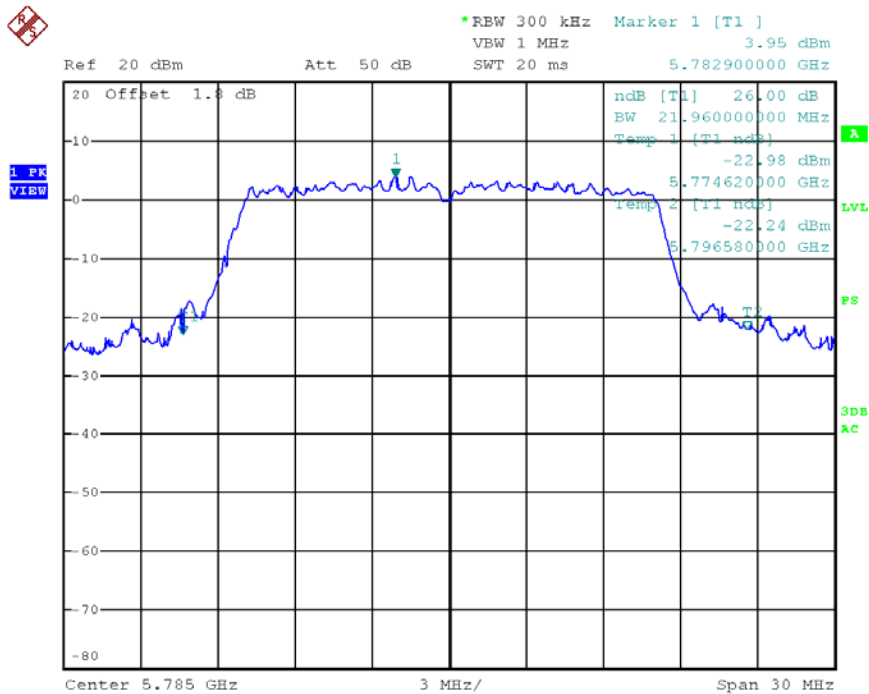
5240MHz

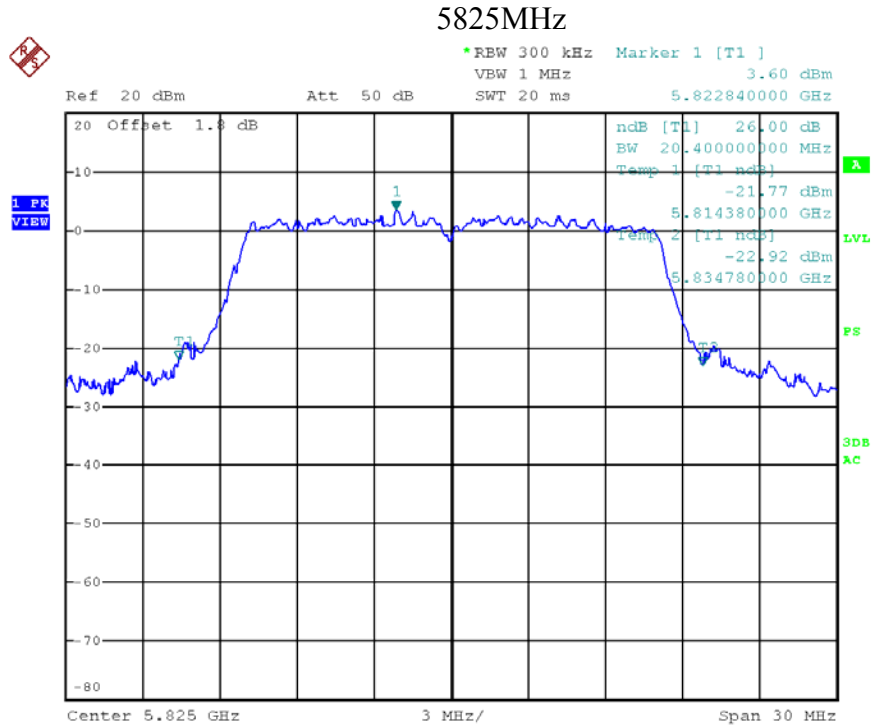


5745MHz



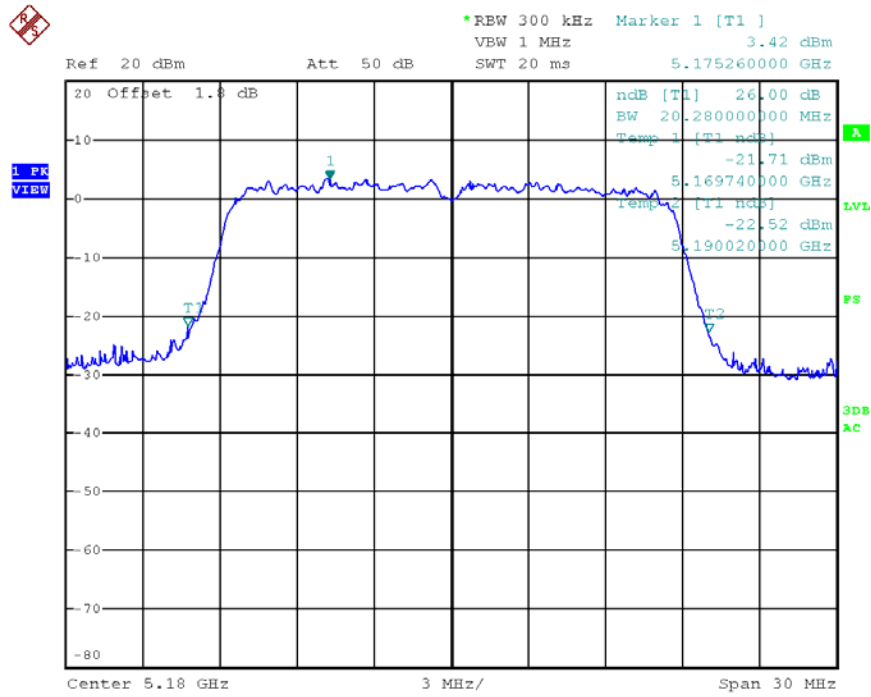
5785MHz



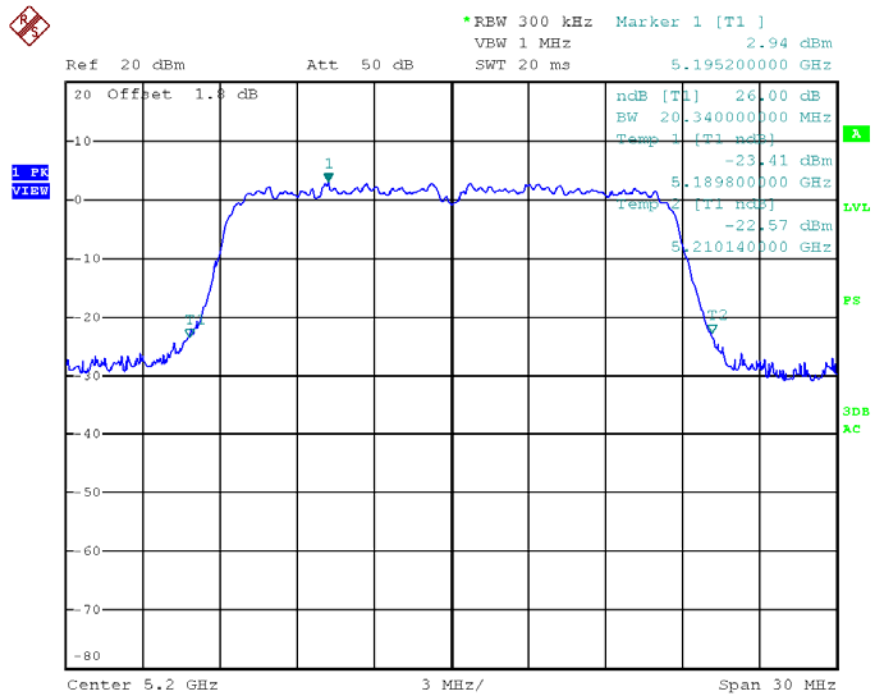


Mode	Frequency (MHz)	26 dB Bandwidth (MHz)
802.11 n20	5180	20.28
	5200	20.34
	5240	20.28
	5745	24.24
	5785	20.82
	5825	20.70

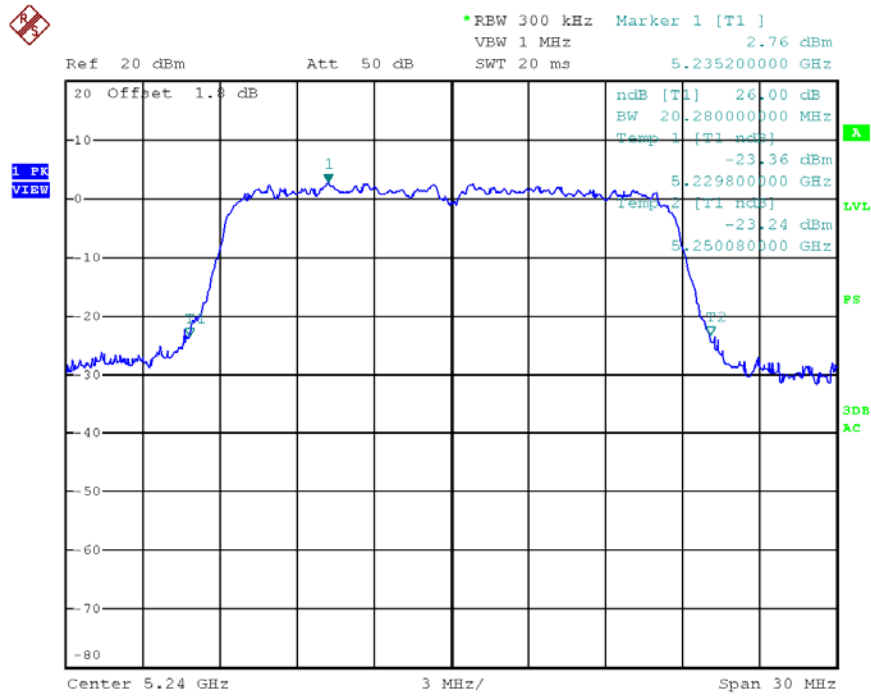
5180MHz



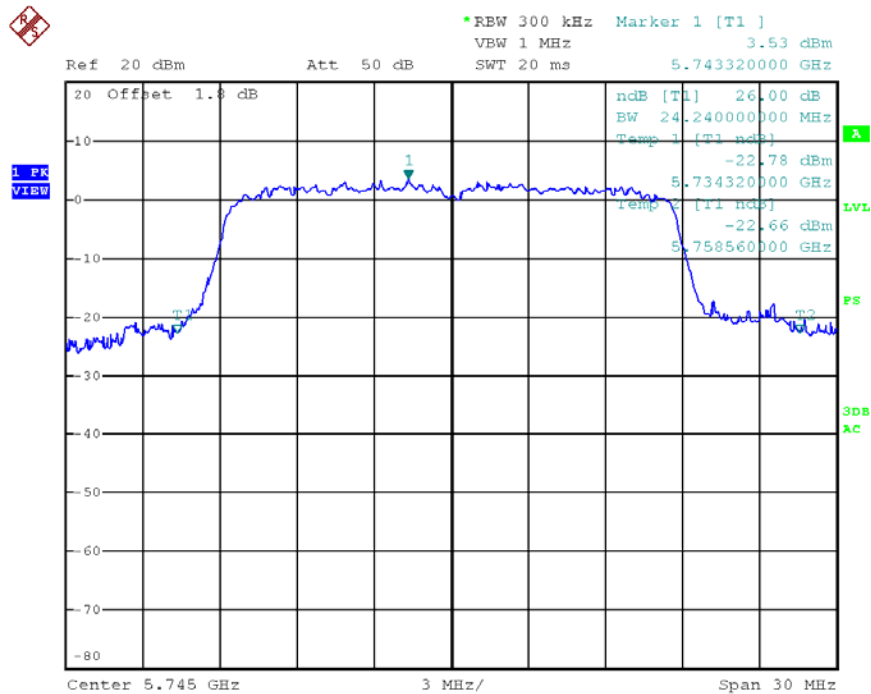
5200MHz



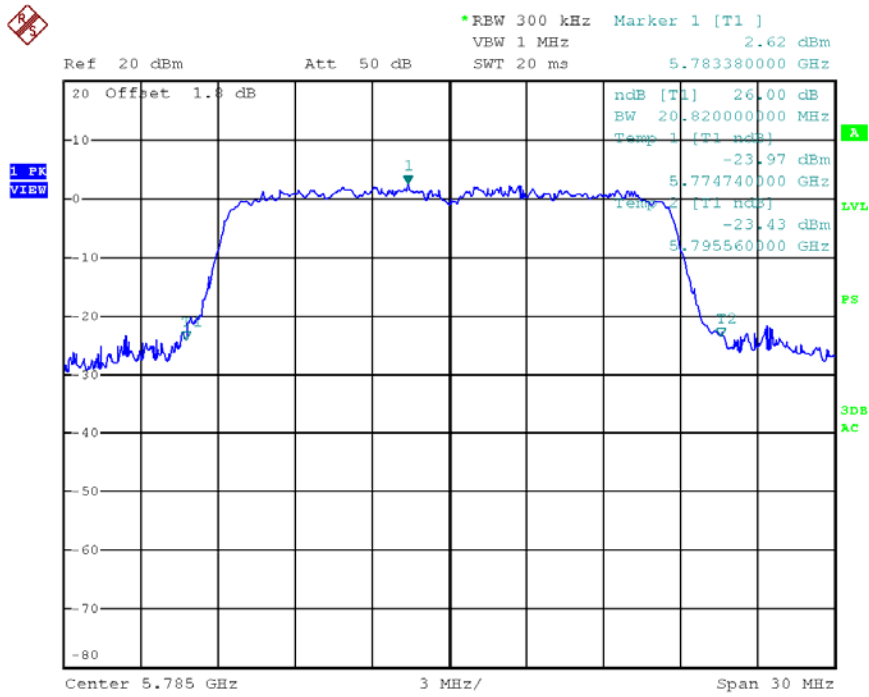
5240MHz



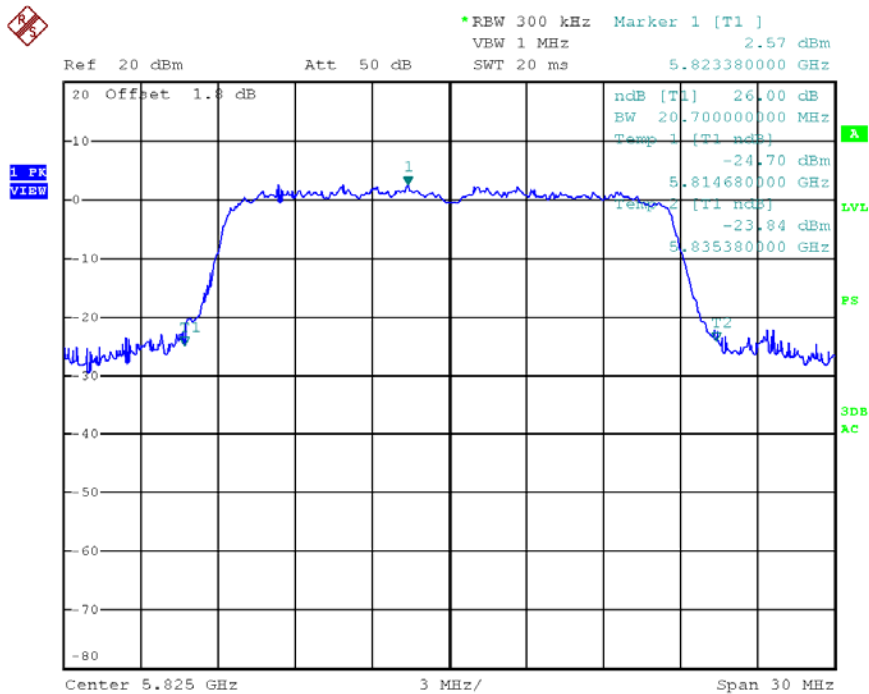
5745MHz



5785MHz



5825MHz



8.5 Measurement uncertainty

Measurement uncertainty: $\pm 3 \%$

The measurement uncertainty is given with a confidence of 95%, $k=2$.

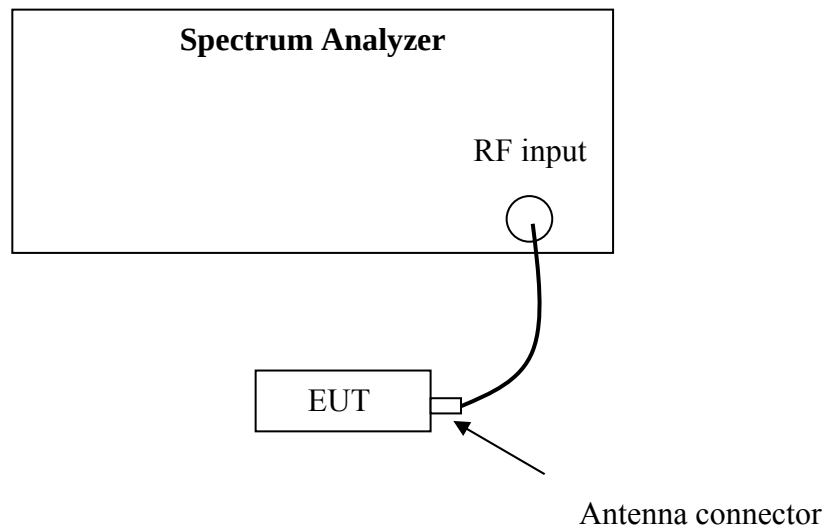
9. 99% Bandwidth

Test Status: Tested

9.1 Test limit

None

9.2 Test Configuration



9.3 Test procedure and test setup

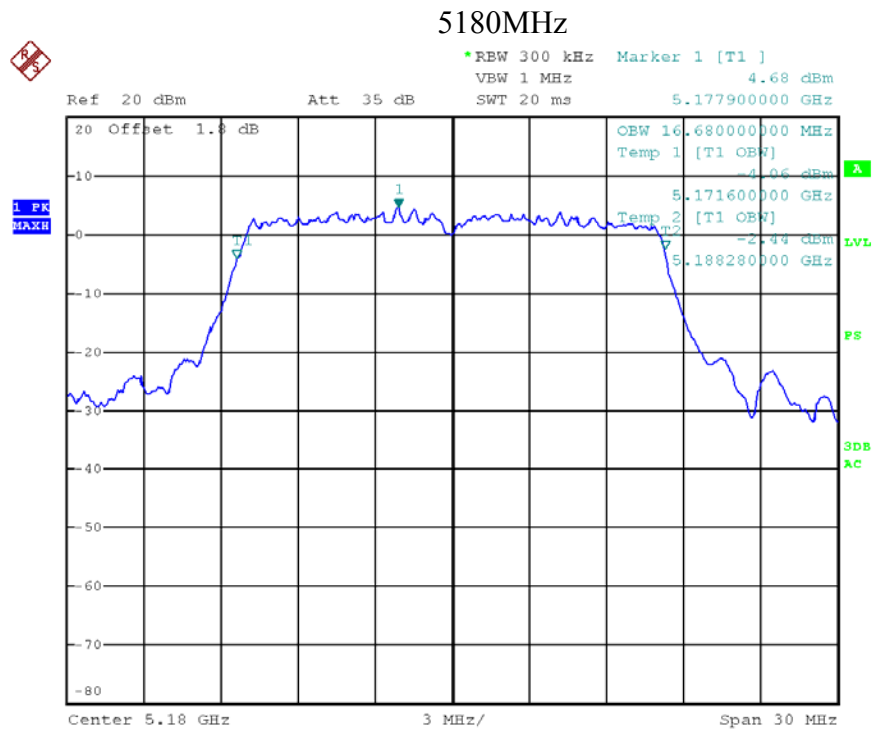
For 99% bandwidth test:

The measurement methods refer to KDB 789033D02: section C.

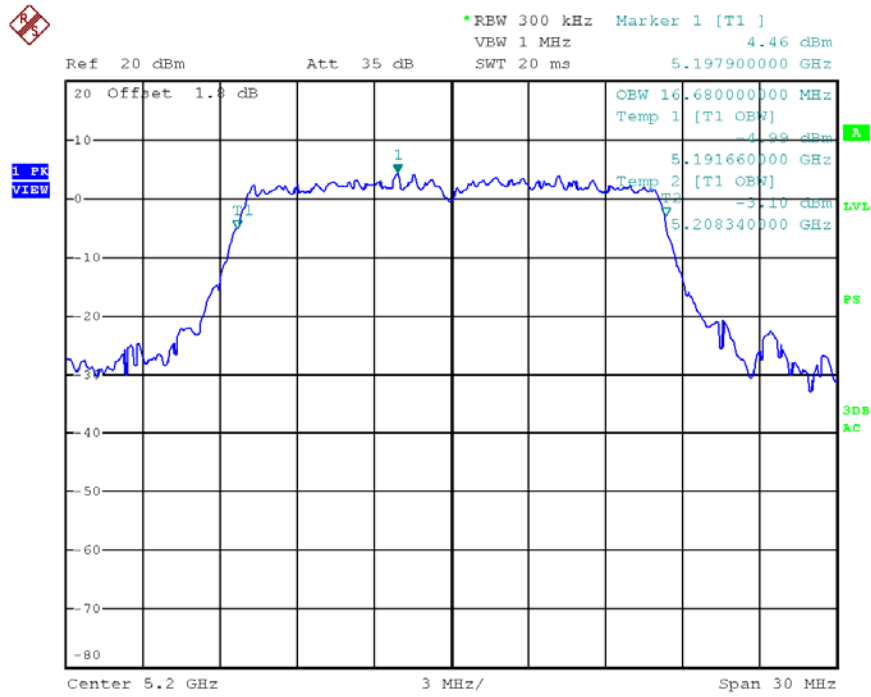
9.4 Test protocol

Temperature : 25 °C
Relative Humidity : 55 %

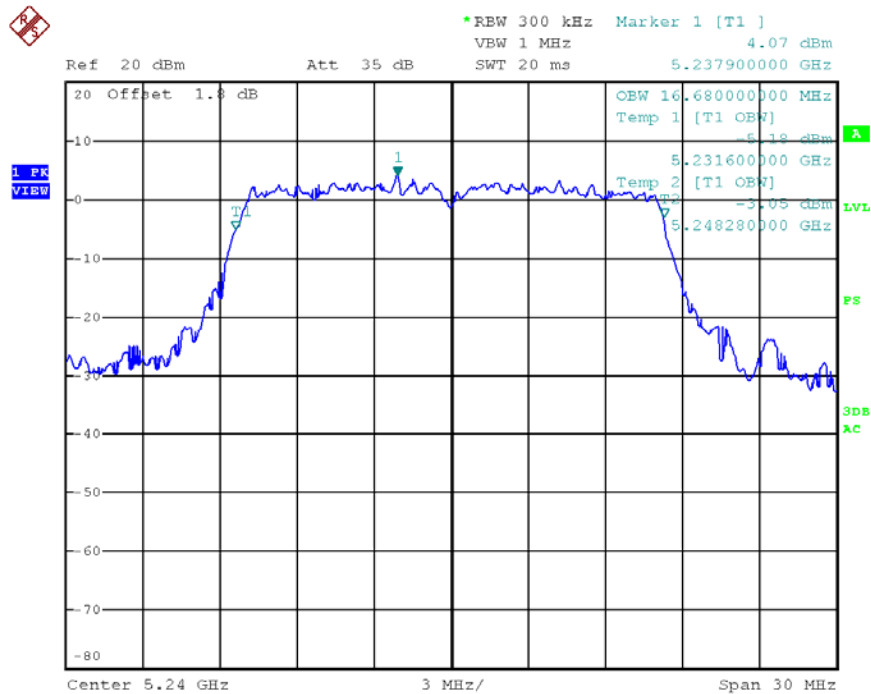
Mode	Frequency (MHz)	99% Bandwidth (MHz)
802.11a	5180	16.68
	5200	16.68
	5240	16.68
	5745	16.86
	5785	16.74
	5825	16.74



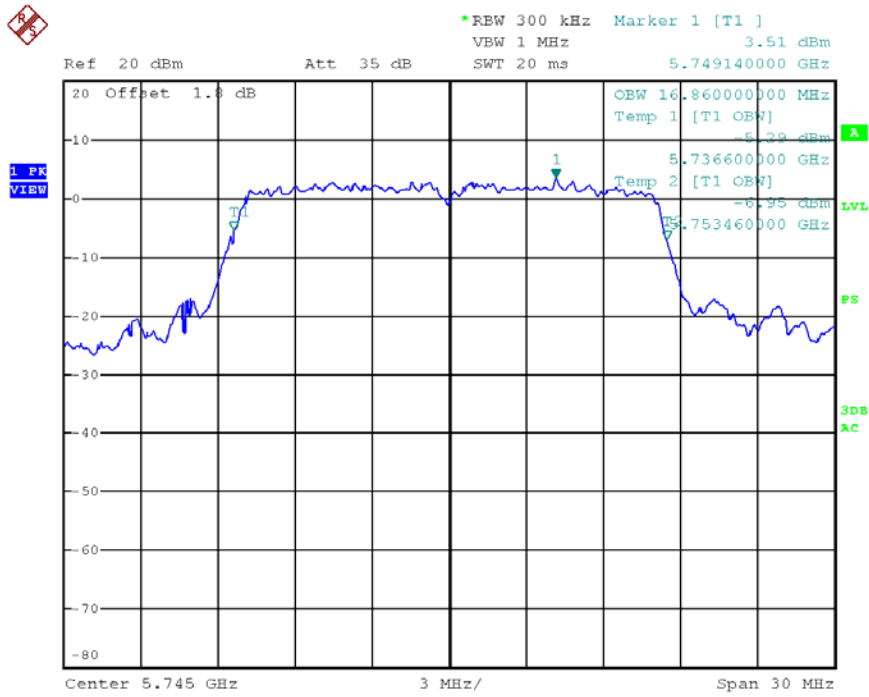
5200MHz



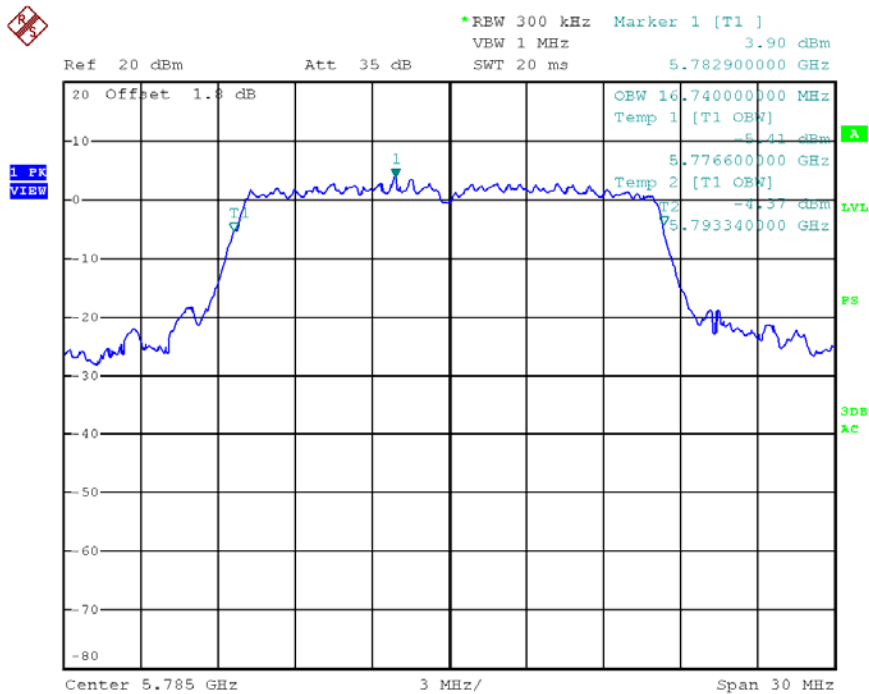
5240MHz

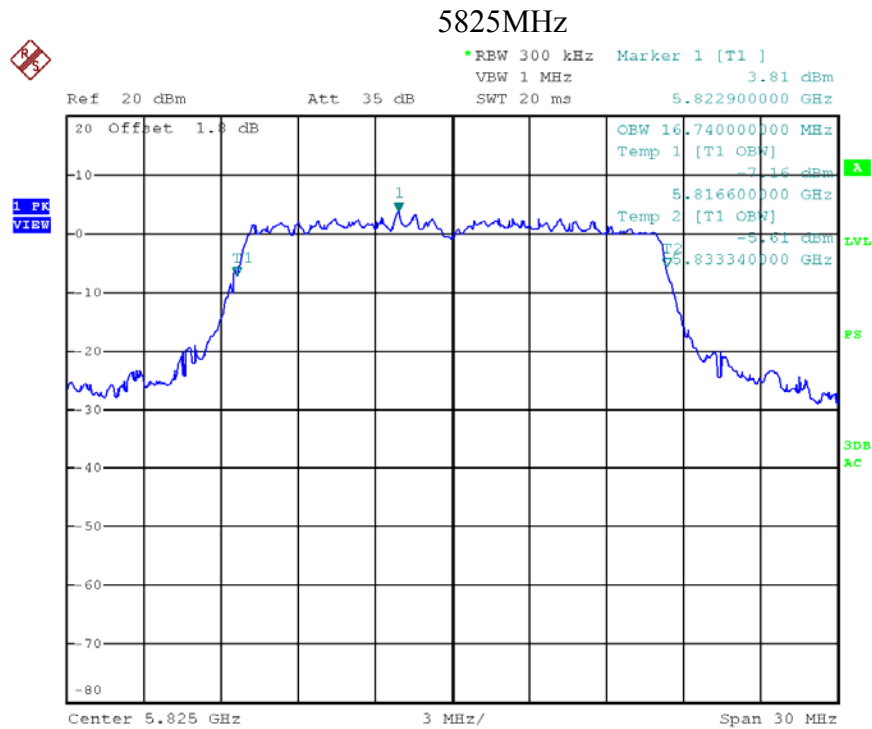


5745MHz



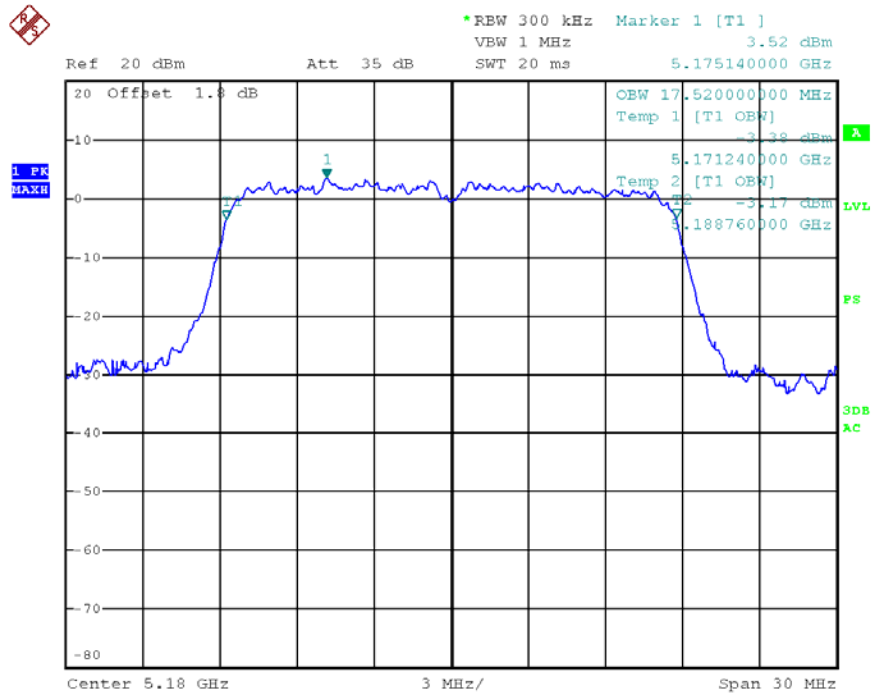
5785MHz



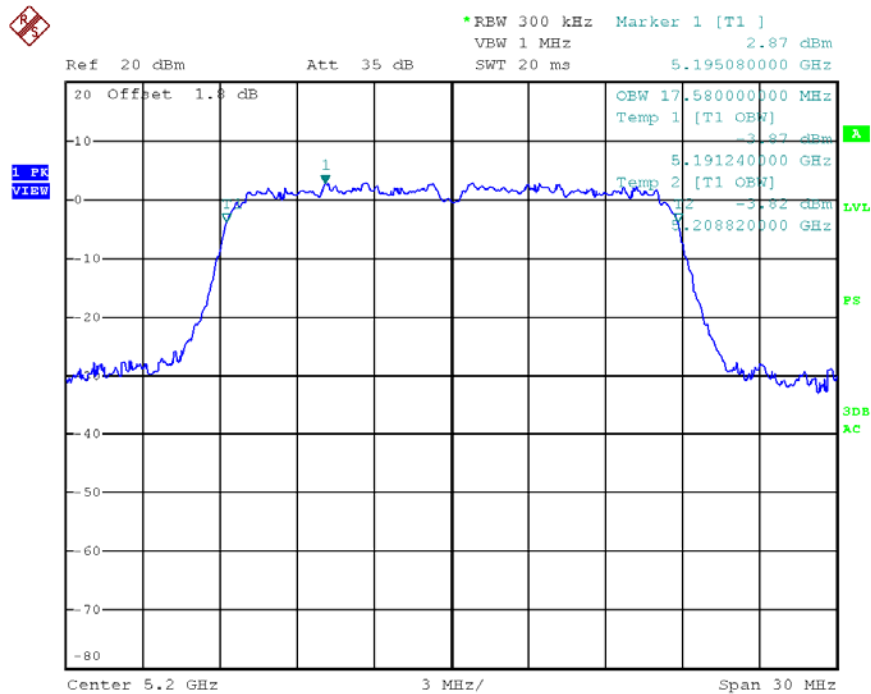


Mode	Frequency (MHz)	99% Bandwidth (MHz)
802.11 n20	5180	17.52
	5200	17.58
	5240	17.52
	5745	17.64
	5785	17.58
	5825	17.64

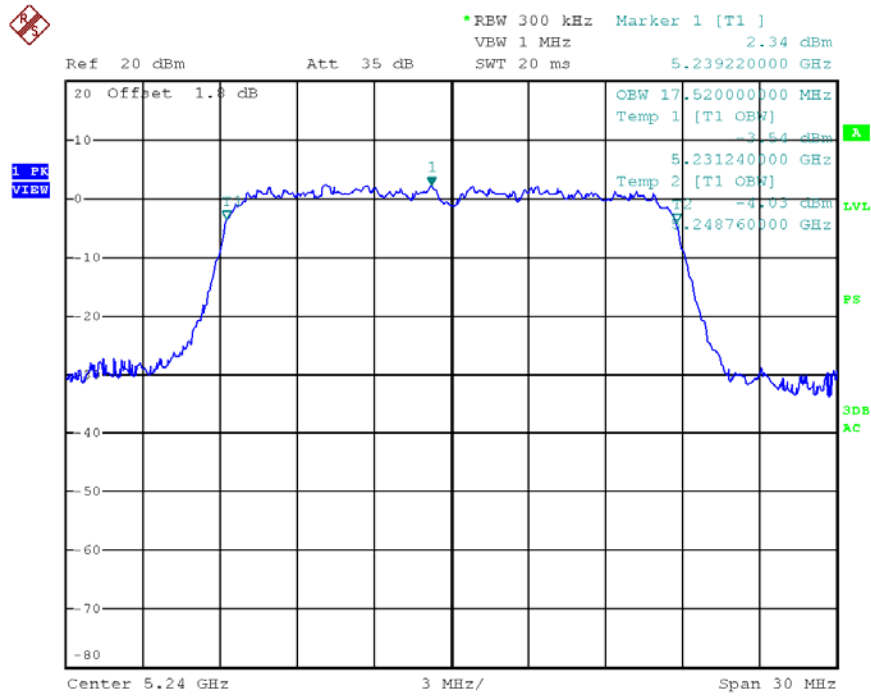
5180MHz



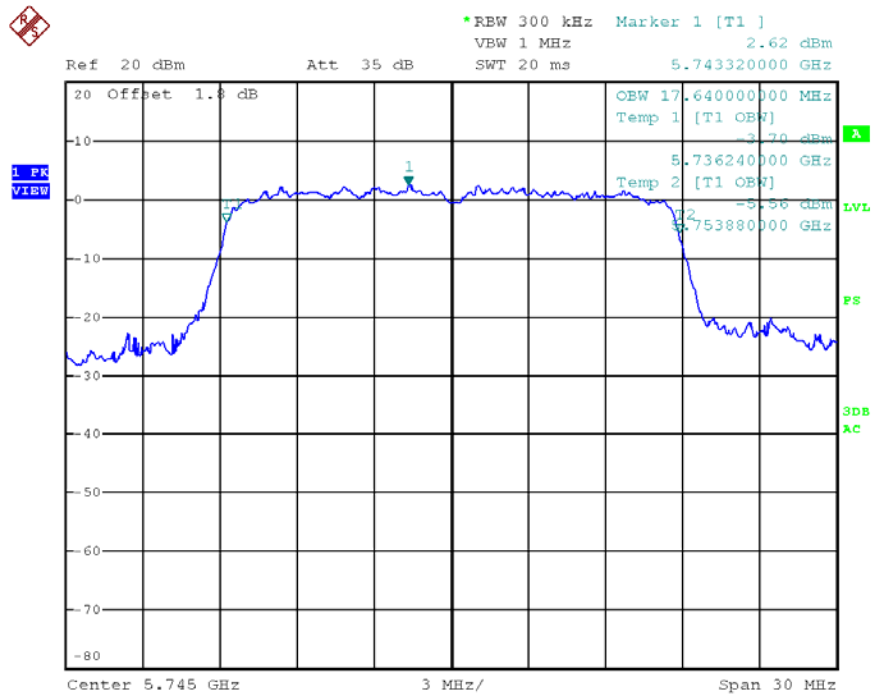
5200MHz



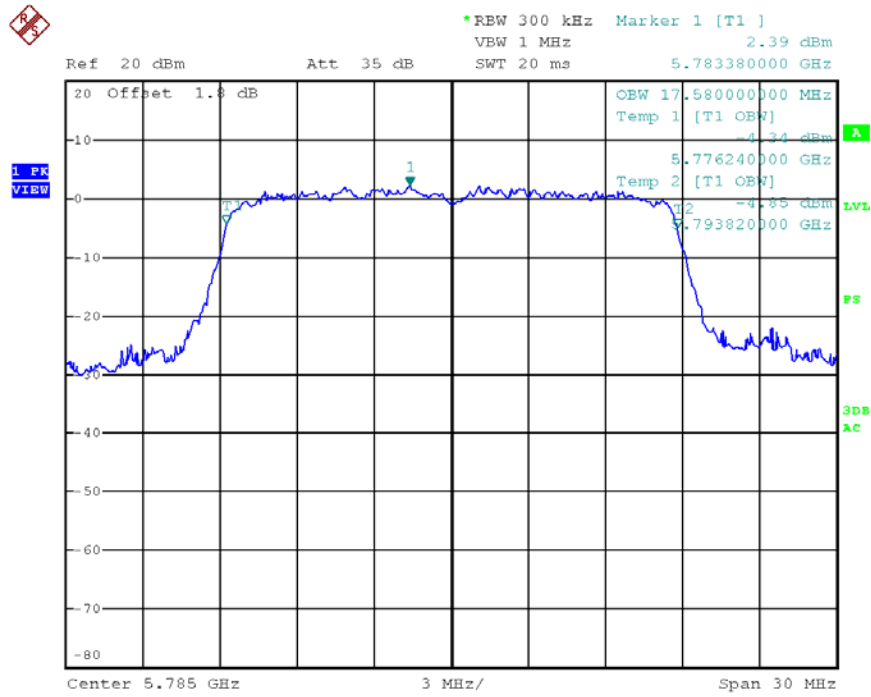
5240MHz



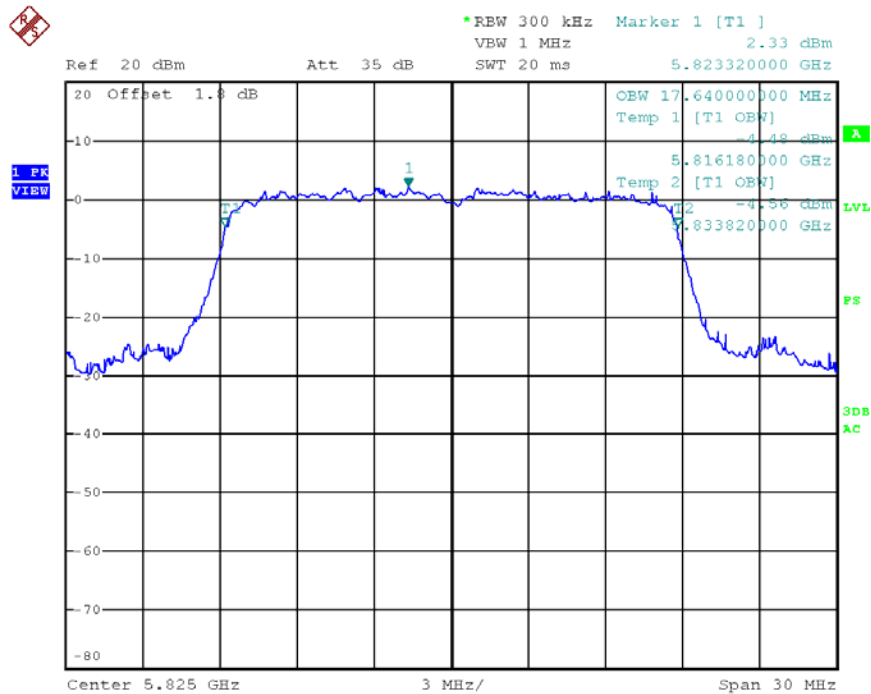
5745MHz



5785MHz



5825MHz



9.5 Measurement uncertainty

Measurement uncertainty: $\pm 3 \%$

The measurement uncertainty is given with a confidence of 95%, $k=2$.