SGS-CSTC Standards Technical Services
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1 Cover Page

FCC Part 15E TEST REPORT

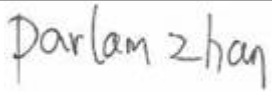
Application No.:	SHEM1603000990CR
Applicant:	Zhejiang Dahua Vision Technology Co., Ltd.
FCC ID:	SVNDH-PFM88
Equipment Under Test (EUT): **NOTE:** The following sample(s) was/were submitted and identified by the client as	
Product Name:	5G Wireless Video Transmission Device CPE
Model No.(EUT):	DH-PFM881
Add Model No.:	PFM881, DHI-PFM881
Standards:	FCC PART 15 Subpart E: 2015
Date of Receipt:	2016-03-16
Date of Test:	2016-04-12 to 2016-04-18
Date of Issue:	2016-05-03
Test Result:	**Pass***

*In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Parlam Zhan
E&E Section Manager
SGS-CSTC (Shanghai) Co., Ltd.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00	/	2016-05-03	/	Original

Authorized for issue by:				
Engineer		Eddy Zong **Print Name**		
Clerk		Susie Liu **Print Name**		
Reviewer		Parlam Zhan **Print Name**		

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	15.203 & 15.407 a(1)&(3)	-	PASS
AC Power Line Conducted Emission	15.407 b(6)	ANSI C63.10 (2013) Clause 6.2	PASS
26 dB Emission bandwidth	15.403 i	KDB 789033 D02 KDB 644545 KDB 662911 D01 v02r01 KDB 662911 D02 v01	PASS
Minimum 6 dB bandwidth (5.725-5.85 GHz band)	15.407 (e)		PASS
Maximum Conducted output power	15.407 a(1)&(3)		PASS
Transmitter Power Control	15.407 (h)(1)		N/A
Peak Power spectrum density	15.407 a(1)&(3)		PASS
Radiated Spurious emissions and Band-edge	15.209 & 15.407		PASS
Transmission in the Absence of Data	15.407 (c)		PASS
Frequency Stability	15.407 (g)		PASS
Dynamic Frequency Selection	15.407 (h)(2)	KDB 905462 D02 KDB 905462 D03	N/A

Notes1: N/A: The device no DFS Band.

Note2: There are series models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model DH-PFM881 was tested since their differences were the model number, trade name and appearance deviation.

4 Contents

5 General Information

5.1 Client Information

Applicant:	Zhejiang Dahua Vision Technology Co., Ltd.
Address of Applicant:	The 1st Floor, Building F, No.1199 Binan Road, Changhe Street, Binjiang District, Hangzhou, Zhejiang, P.R.China
Manufacturer:	Zhejiang Dahua Vision Technology Co., Ltd.
Address of Manufacturer:	The 1st Floor, Building F, No.1199 Binan Road, Changhe Street, Binjiang District, Hangzhou, Zhejiang, P.R.China
Factory:	Zhejiang Dahua Vision Technology Co., Ltd.
Address of Factory:	No.1199 Binan Road, Changhe Street, Binjiang District, Hangzhou, Zhejiang, P.R.China

5.2 General Description of E.U.T.

Product Description:		Portable product with WiFi function	
Rated Input:		DC 24V 0.5A PoE	
Adapter:	Model No.:	GRT-240050	
	Rated Input:	AC 100V-240V 50/60Hz	
	Rated Output:	DC 24V 500mA	
	Cable length:	AC port:	2 wires
		DC port:	90 cm
Test Voltage:	AC 120V 60Hz for adapter		

5.3 Technical Specifications

Operation Frequency:	5745-5825MHz
Modulation Technique:	OFDM(64QAM, 16QAM, QPSK, BPSK)
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: MCS0-15 up to 300Mbps
Antenna Type	Integral antenna (2Tx2R MIMO)
Antenna Gain	15dBi
Number of Channel:	802.11 a/n(HT20): 5 Channel 149, 153, 157, 161, 165 802.11 n(HT40): 2 Channel 151, 159

a. Operation Frequency of Each Channel:

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
149	**5745**	***155***	***5775***	161	5805
151	**5755**	**157**	**5785**	165	5825
153	5765	**159**	**5795**		

Note: The above Frequency and Channel in boldface were 40MHz bandwidth; in boldface and Italic were 80MHz bandwidth.

b. The device employs MIMO technology. Below are the possible configurations.

Antenna Configurations		Single Input Single Output		Spatial Diversity Multiplexing-MIMO function	
		Antenna A	Antenna B	Antenna A	Antenna B
5GHz	11a	☒	☒	☐	☐
	11n(HT20)	☒	☒	☒	☒
	11n(HT40)	☒	☒	☒	☒

Remark: ☒=Support; ☐NOT Support

5.4 Test Mode

Test Mode	Description of Test Mode
Engineering mode	Using test software to control EUT working in continuous transmitting, and select channel and modulation type.

5.5 Test Channel

Preliminary tests were performed in all tests in different data rata and antenna configurations at lowest channel, the data rates of worse case as below were chosen for final test.

Band	802.11a			802.11 n(HT20)			802.11n(HT40)		
	Channel	Freq	Rate	Channel	Freq	Rate	Channel	Freq	Rate
U-NII 3	149	5745	6Mbps	149	5745	MCS0	151	5755	MCS0
	157	5785	6Mbps	157	5785	MCS0	-	-	-
	165	5825	6Mbps	165	5825	MCS0	159	5795	MCS0

5.6 Description of Support Units

The EUT has been tested with support equipments as below.

Description	Manufacturer	Model No.	Supplied By
Laptop	Lenovo	ThinkPad X100e	SGS

Software name	Manufacturer	Version	Supplied By
Atheros Radio Test2	Atheros	V 2.3	SGS

5.7 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

5.8 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

  CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **FCC – Registration No.: 402683**

  SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

  The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1.

- **VCCI (Member No.: 3061)**

  The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively.

5.9 Measurement Uncertainty

No.	Parameter	Measurement Uncertainty
1	Radio Frequency	< ±1 x 10^{-5}
2	Total RF power, conducted	< ±1.5 dB
3	RF power density, conducted	< ±3 dB
4	Spurious emissions, conducted	< ±3 dB
5	All emissions, radiated	< ±6 dB (30MHz – 1GHz) < ±6 dB (above 1GHz)
6	Temperature	< ±1°C
7	Humidity	< ±5 %
8	DC and low frequency voltages	< ±3 %

6 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2016-01-14	2017-01-13
2	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127490	2016-01-14	2017-01-13
3	Line impedance stabilization network	EMCO	3816/2	00034161	2016-01-14	2017-01-13
4	Spectrum Analyzer	Rohde & Schwarz	FSP-30	100324	2016-01-14	2017-01-13
5	EMI test receiver	Rohde & Schwarz	ESU40	100109	2016-01-14	2017-01-13
6	Active Loop Antenna (9kHz to 30MHz)	Schwarzbeck - Mess-Elektronik	FMZB 1519	1519-034	2016-01-14	2017-01-13
7	Broadband UHF-VHF ANTENNA (25MHz to 2GHz)	SCHWARZBECK	VULB9168	9168-313	2016-01-14	2017-01-13
8	Ultra broadband antenna (25MHz to3GHz)	Rohde & Schwarz	HL562	100227	2015-08-30	2016-08-29
9	Horn Antenna (1GHz to 18GHz)	Rohde & Schwarz	HF906	100284	2016-01-14	2017-01-13
10	Horn Antenna (1GHz to 18GHz)	SCHWARZBECK	BBHA9120D	9120D-679	2016-01-14	2017-01-13
11	Horn Antenna (14GHz to 40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170373	2016-01-14	2017-01-13
12	Pre-amplifier (9KHz – 2GHz)	LNA6900	TESEQ	71033	2016-01-14	2017-01-13
13	Pre-amplifier (1GHz – 26.5GHz)	Rohde & Schwarz	SCU-F0118-G40-BZ4-CSS(F)	10001	2016-01-14	2017-01-13
14	Pre-amplifier (14GHz – 40GHz)	Rohde & Schwarz	SCU-F1840-G35-BZ3-CSS(F)	10001	2016-01-14	2017-01-13
15	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT800.0/880.0-0.2/40-5SSK	9170397	/	/
16	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	/	/
17	High-low temperature cabinet	Suzhou Zhihe	TL-40	50110050	2015-09-11	2016-09-10
18	AC power stabilizer	WOCEN	6100	51122	2016-01-14	2017-01-13
19	DC power	QJE	QJ30003SII	611145	2016-01-14	2017-01-13
20	Signal Generator (Interferer)	Agilent	SMR40	100555	2015-08-13	2016-08-12
21	Signal Generator (Blocker)	Rohde & Schwarz	SMJ100A	101394	2016-01-14	2017-01-13
22	Splitter	Anritsu	MA1612A	M12265	/	/
23	Coupler	e-meca	803-S-1	900-M01	/	/

7 Test Results

7.1 E.U.T. Test Conditions

Test Voltage: AC 120V, 50Hz

Requirements: 15.31(e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

Operating Environment:

Temperature:	20.0 -25.0 °C
Humidity:	35-75 % RH
Atmospheric Pressure:	99.2 -102.0 kPa

Test frequencies: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and. if required. reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top. 1 near middle and 1 near bottom

Pursuant to Part 15.31(c) For swept frequency equipment, measurements shall be made with the frequency sweep stopped at those frequencies chosen for the measurements to be reported

7.2 Antenna Requirement

Standard requirement:

15.203 requirement:

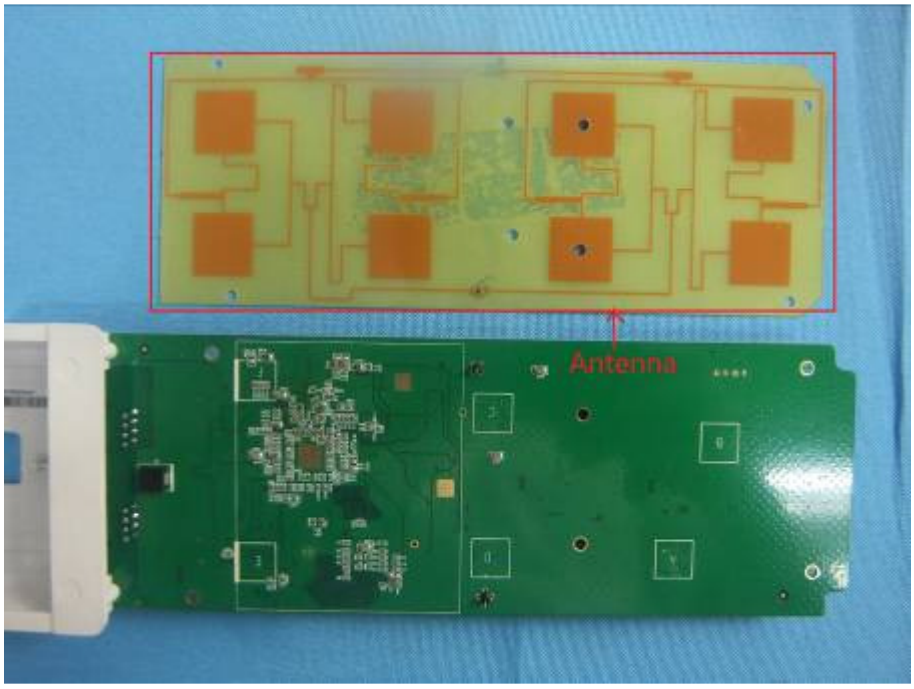
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited

This requirement does not apply to carrier current devices. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

EUT Antenna:

The antenna is 2Tx2R Spatial Multiplexing MIMO with Cross-Polarized Antenna. The gain is less than 15dBi.

The intentional radiators that must be professionally installed.



7.3 Conducted Emissions on Mains Terminals

Frequency Range: 150 KHz to 30 MHz

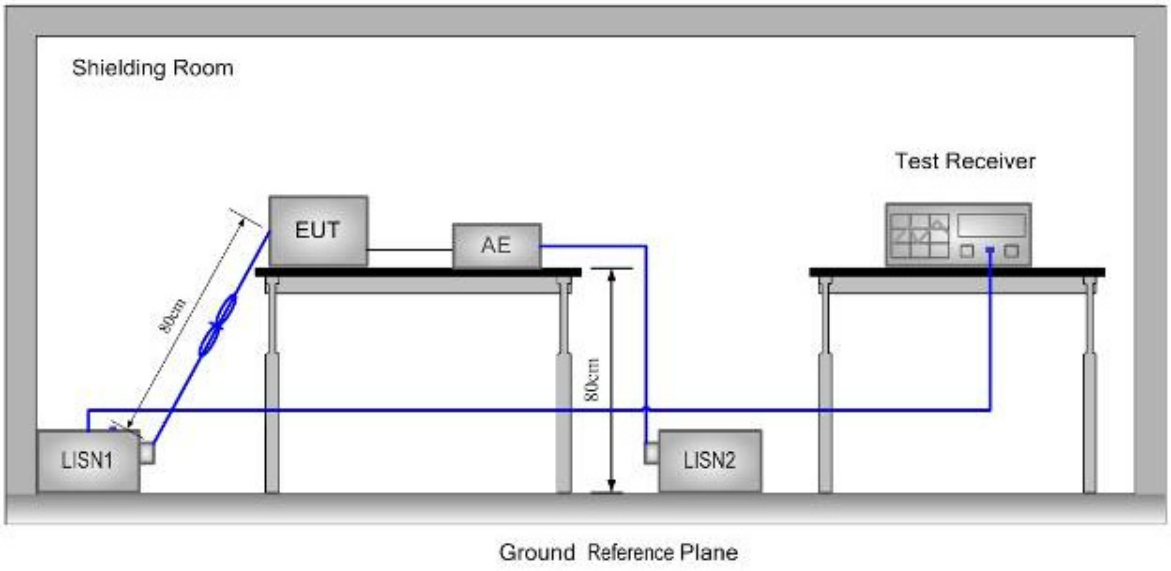
Class/Severity: Class B

Limit:

Frequency range MHz	Class B Limits: dB (μV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz. Note2: The lower limit is applicable at the transition frequency.		

Test site/setup: Test instrumentation set-up:

Frequency Range	Detector	RBW	VBW
9KHz to 150Hz	Quasi-peak	200Hz	500Hz
150KHz to 30MHz	Quasi-peak	9kHz	30kHz



Test Procedure:

a) The mains terminal disturbance voltage was measured with the EUT in a shielded room.

b) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN, which was bonded to the ground reference plane in the same way as the LISN for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded

c) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.

d) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to

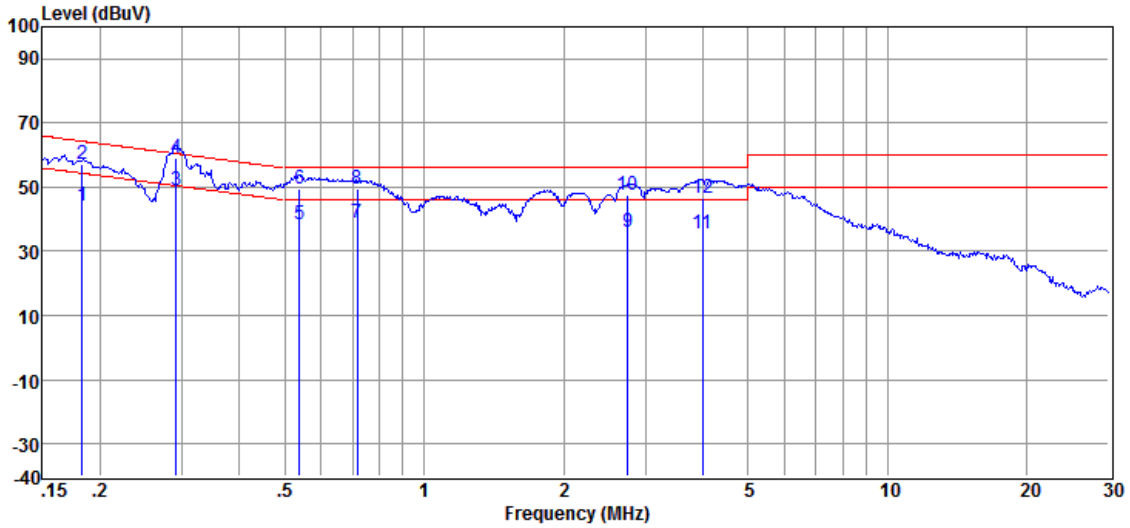
the horizontal ground reference plane. The LISN was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance was between the closest points of the LISN and the EUT. The mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m. All other units of the EUT and associated equipment were at least 0.8 m from the LISN.

Remark: Pre-scan was performed with peak detected on all ports, Quasi-peak & average measurements were performed at the frequencies at which maximum peak emission level were detected. Pretest under all modes; choose the worst case mode (802.11a in Middle channel) record on the report. Please see the attached Quasi-peak and Average test results.

Test Result: Pass

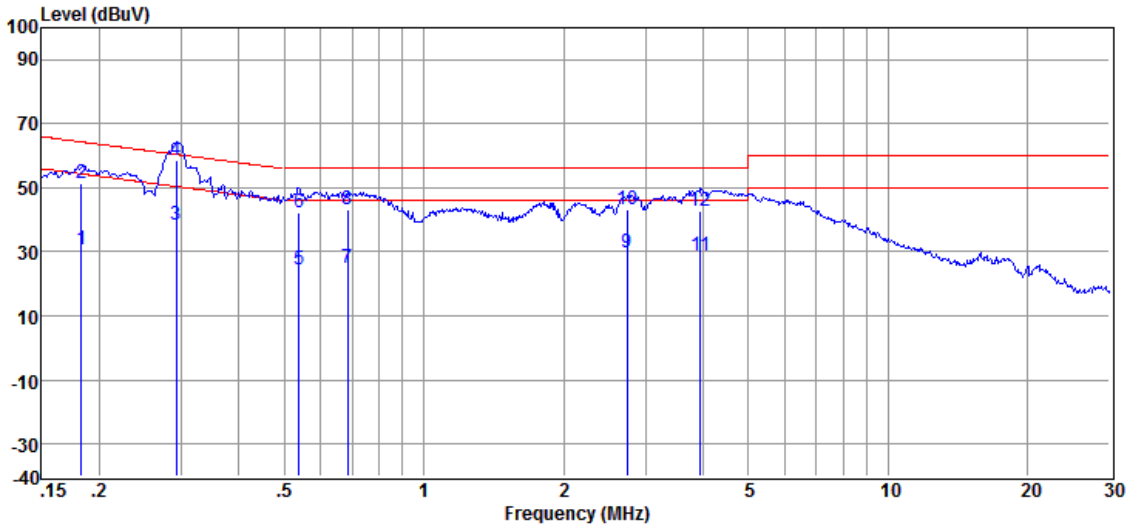
Test Data:

Test Mode:	802.11a	**Test Channel:**	Channel 157
Test Port:	AC Live Line		



Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB)	(dB)	(dBµV)	(dBµV)	(dB)	
1	0.183	34.04	0.28	9.86	44.18	54.35	-10.17	Average
2	0.183	47.17	0.28	9.86	57.31	64.35	-7.04	QP
3	0.292	38.82	0.26	9.86	48.94	50.47	-1.53	Average
4	0.292	49.02	0.26	9.86	59.14	60.47	-1.33	QP
5	0.538	28.53	0.24	9.86	38.63	46.00	-7.37	Average
6	0.538	39.31	0.24	9.86	49.41	56.00	-6.59	QP
7	0.717	29.05	0.22	9.86	39.13	46.00	-6.87	Average
8	0.717	39.47	0.22	9.86	49.55	56.00	-6.45	QP
9	2.752	25.70	0.37	9.87	35.94	46.00	-10.06	Average
10	2.752	37.37	0.37	9.87	47.61	56.00	-8.39	QP
11	3.982	25.04	0.38	9.89	35.31	46.00	-10.69	Average
12	3.982	36.41	0.38	9.89	46.68	56.00	-9.32	QP

Test Port: AC Neutral Line



Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB)	(dB)	(dBµV)	(dBµV)	(dB)	
1	0.183	20.36	0.31	9.86	30.53	54.34	-23.81	Average
2	0.183	41.39	0.31	9.86	51.56	64.34	-12.78	QP
3	0.293	28.38	0.29	9.86	38.53	50.43	-11.90	Average
4	0.293	48.40	0.29	9.86	58.55	60.43	-1.88	QP
5	0.538	14.31	0.28	9.86	24.45	46.00	-21.55	Average
6	0.538	32.24	0.28	9.86	42.38	56.00	-13.62	QP
7	0.685	15.03	0.20	9.86	25.09	46.00	-20.91	Average
8	0.685	32.98	0.20	9.86	43.04	56.00	-12.96	QP
9	2.742	19.32	0.80	9.87	29.99	46.00	-16.01	Average
10	2.742	32.51	0.80	9.87	43.18	56.00	-12.82	QP
11	3.935	18.20	0.57	9.89	28.66	46.00	-17.34	Average
12	3.935	32.30	0.57	9.89	42.76	56.00	-13.24	QP

Remark: Level = Read Level + LISN/ISN Factor + Cable Loss.

7.4 Duty Cycle

In order to assist with the determination of the average level of fundamental and spurious emissions field strength, measurements were made of duty cycle to determine the transmission duration and the silent period time of the transmitter. The transmitter duty cycle was measured using a spectrum analyser in the time domain and calculated by using the following calculation:

Duty cycle= T on time / Period

Duty factor = 10 * log (1/Duty cycle)

If duty cycle of test signal is > 98%, duty factor is not required.

If duty cycle of test signal is < 98%, duty factor shall be considered.

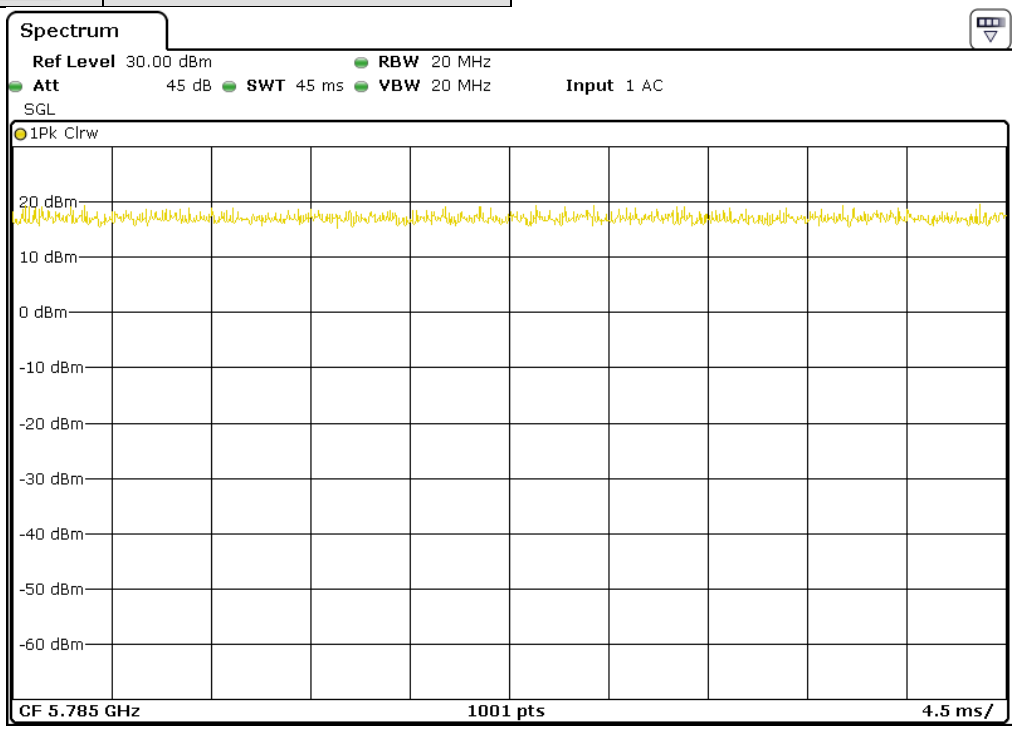
Test Data:

Test Mode	T on time(ms)	Period(ms)	Duty Cycle	Duty Factor
802.11a	10	10	100%	0
802.11n(HT20)	10	10	100%	0
802.11n(HT40)	10	10	100%	0

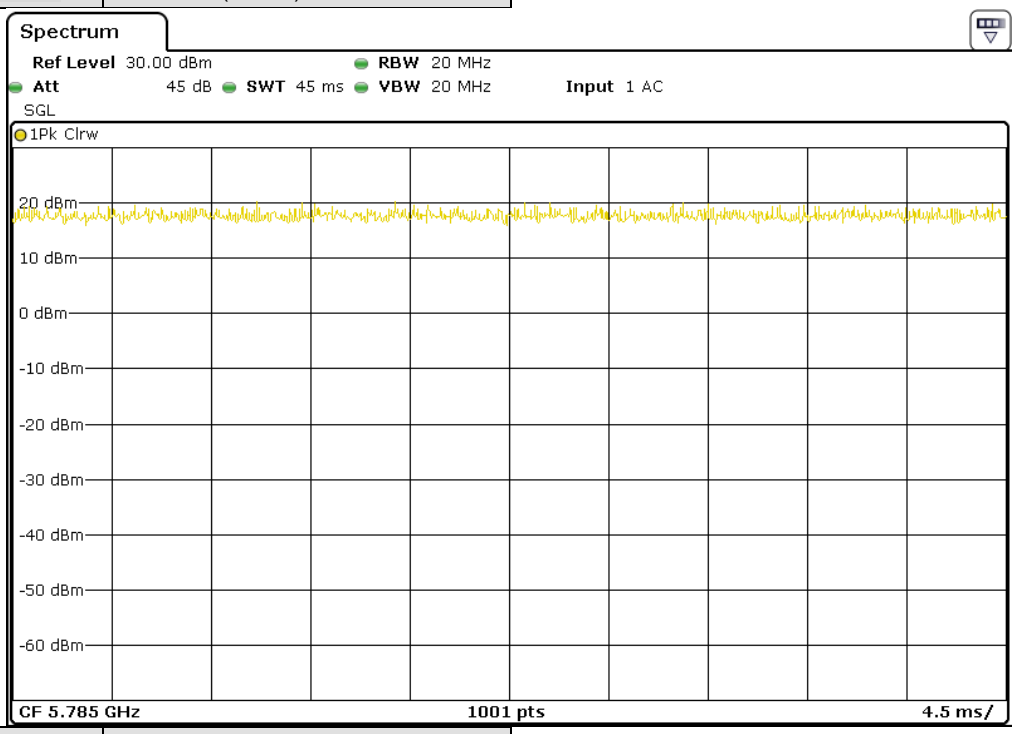
Test Result: All measurements are to be performed with the EUT transmitting at 100 percent duty cycle at its maximum power control level. So duty factor is not required.

Test plot as follows:

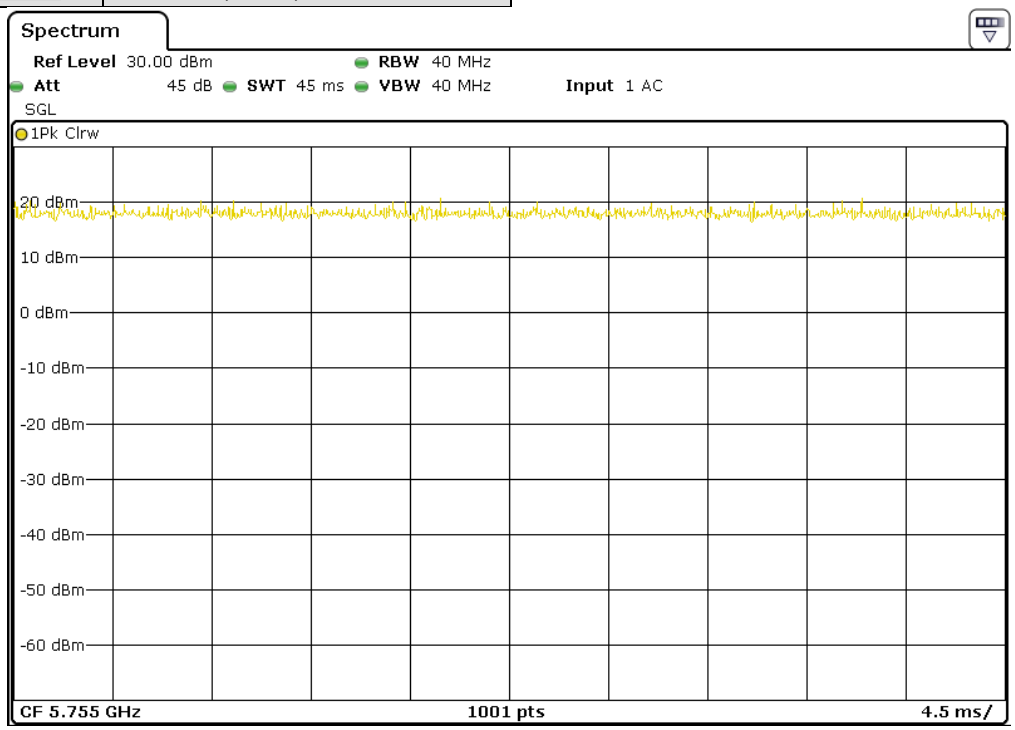
Test mode:	802.11 a



Test mode:	802.11 n(HT20)



Test mode:	802.11 n(HT40)



7.5 26dB Emission Bandwidth

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

Test Data:

For Antenna A:

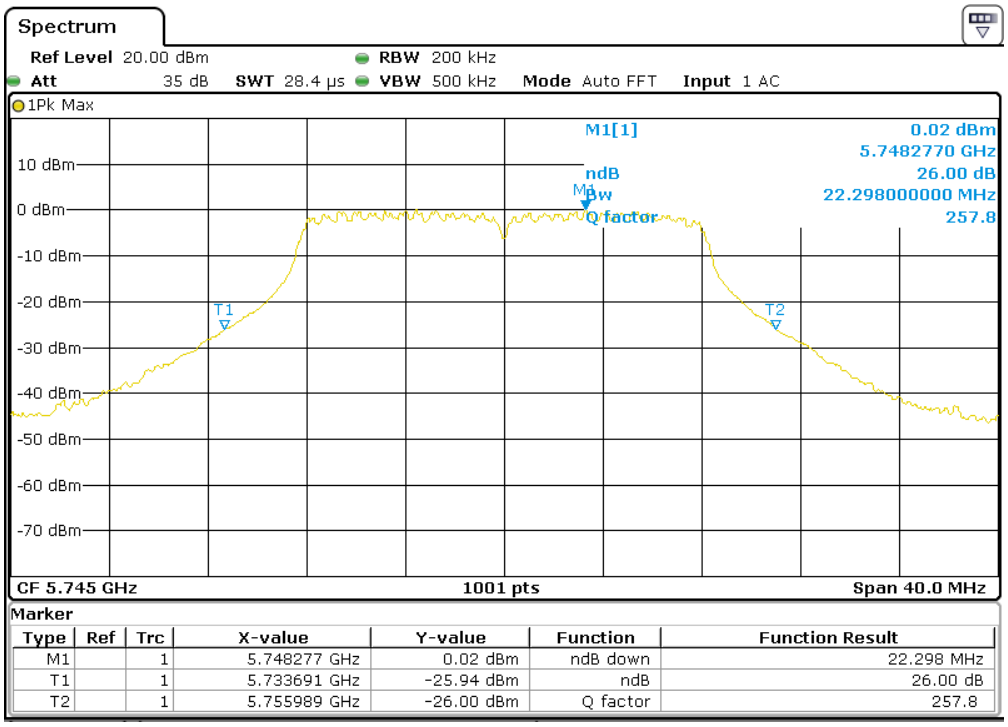
802.11a			802.11 n(HT20)			802.11n(HT40)		
CH No.	Freq(MHz)	BW (MHz)	CH No.	Freq(MHz)	BW (MHz)	CH No.	Freq(MHz)	BW (MHz)
149	5745	22.298	149	5745	22.657	151	5755	43.796
157	5785	22.418	157	5785	22.577	--	--	--
165	5825	21.898	165	5825	22.338	159	5795	44.276

For Antenna B:

802.11a			802.11 n(HT20)			802.11n(HT40)		
CH No.	Freq(MHz)	BW (MHz)	CH No.	Freq(MHz)	BW (MHz)	CH No.	Freq(MHz)	BW (MHz)
149	5745	22.178	149	5745	22.737	151	5755	43.956
157	5785	22.338	157	5785	23.177	--	--	--
165	5825	21.898	165	5825	23.137	159	5795	43.956

Test plot as follows:

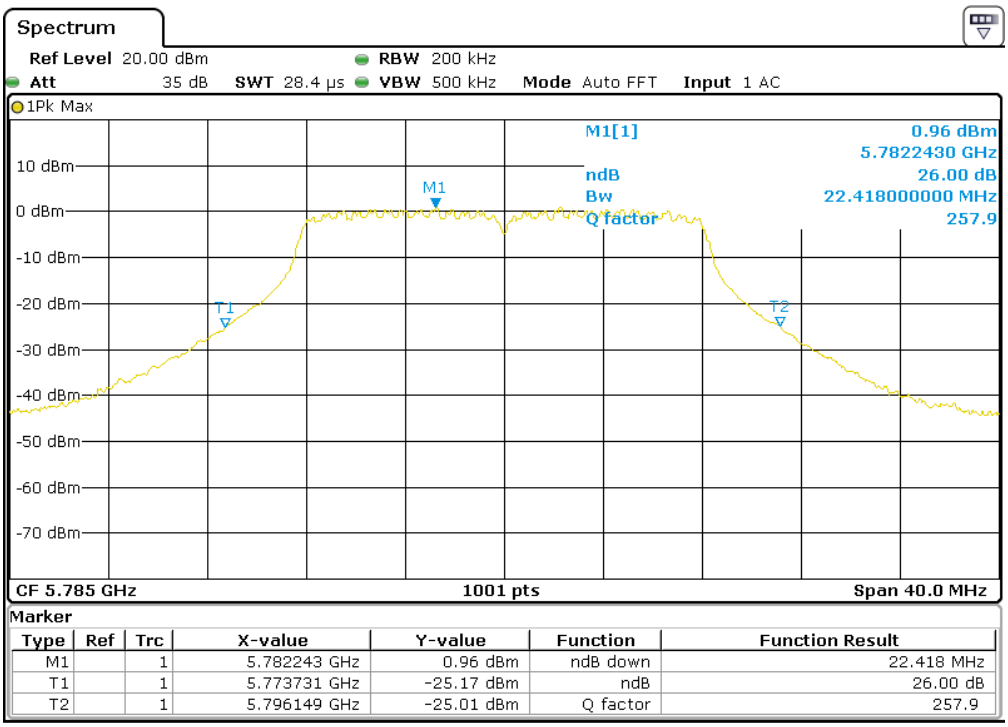
802.11 a	Antenna A	Channel 149



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.748277 GHz	0.02 dBm	ndB down	22.298 MHz
T1		1	5.733691 GHz	-25.94 dBm	ndB	26.00 dB
T2		1	5.755989 GHz	-26.00 dBm	Q factor	257.8

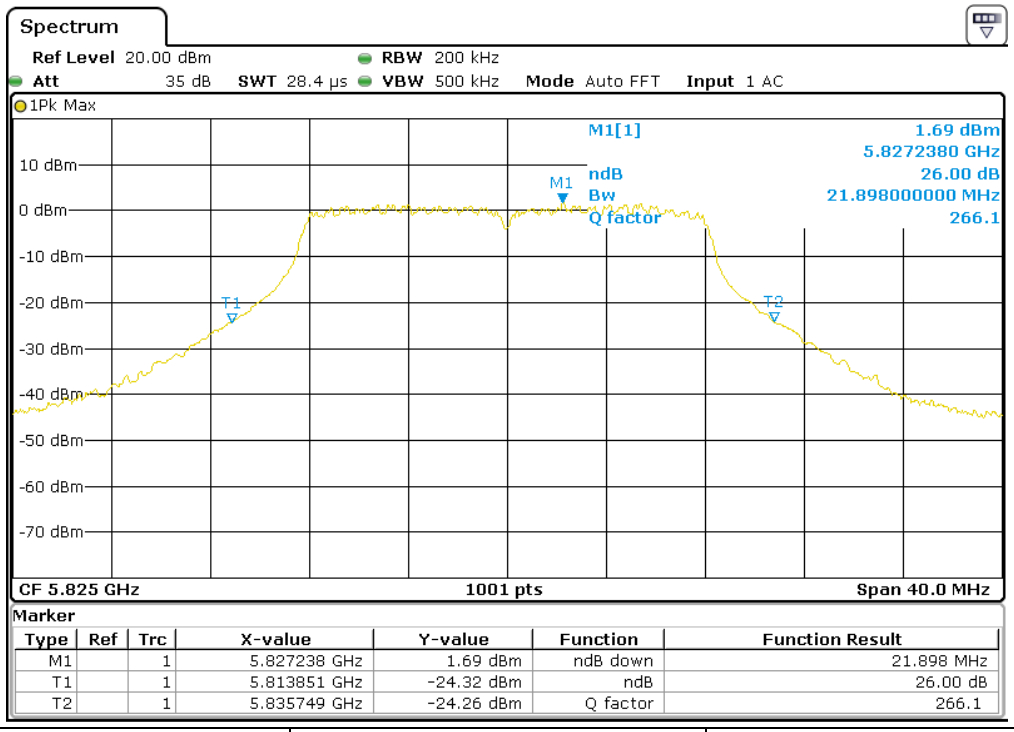
802.11 a	Antenna A	Channel 157



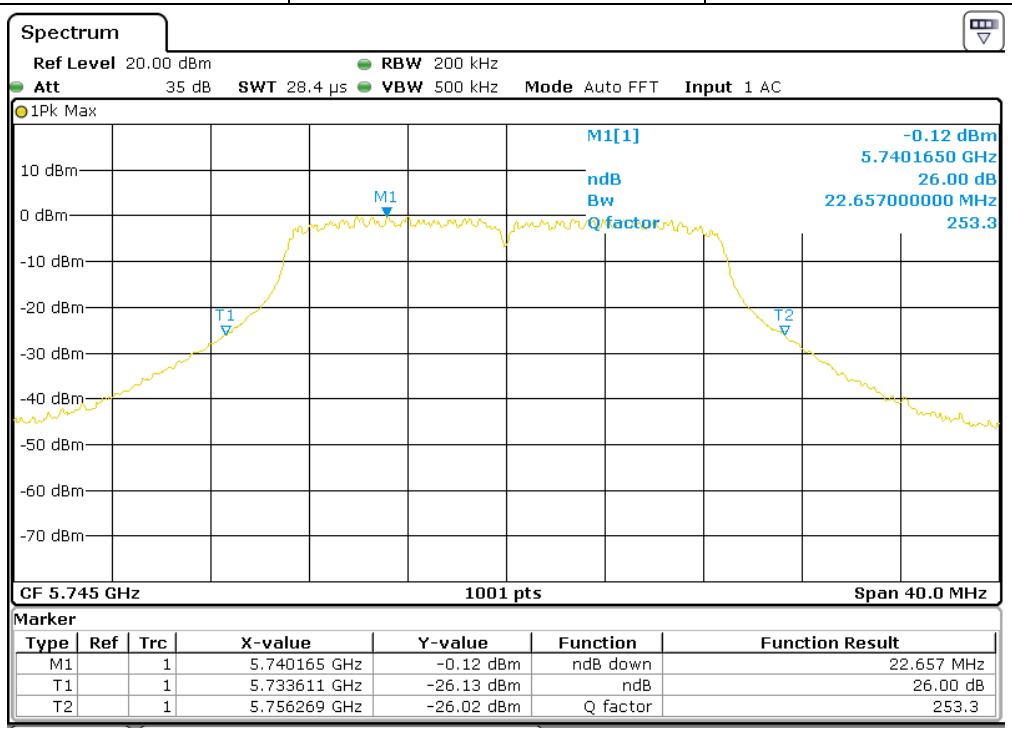
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.782243 GHz	0.96 dBm	ndB down	22.418 MHz
T1		1	5.773731 GHz	-25.17 dBm	ndB	26.00 dB
T2		1	5.796149 GHz	-25.01 dBm	Q factor	257.9

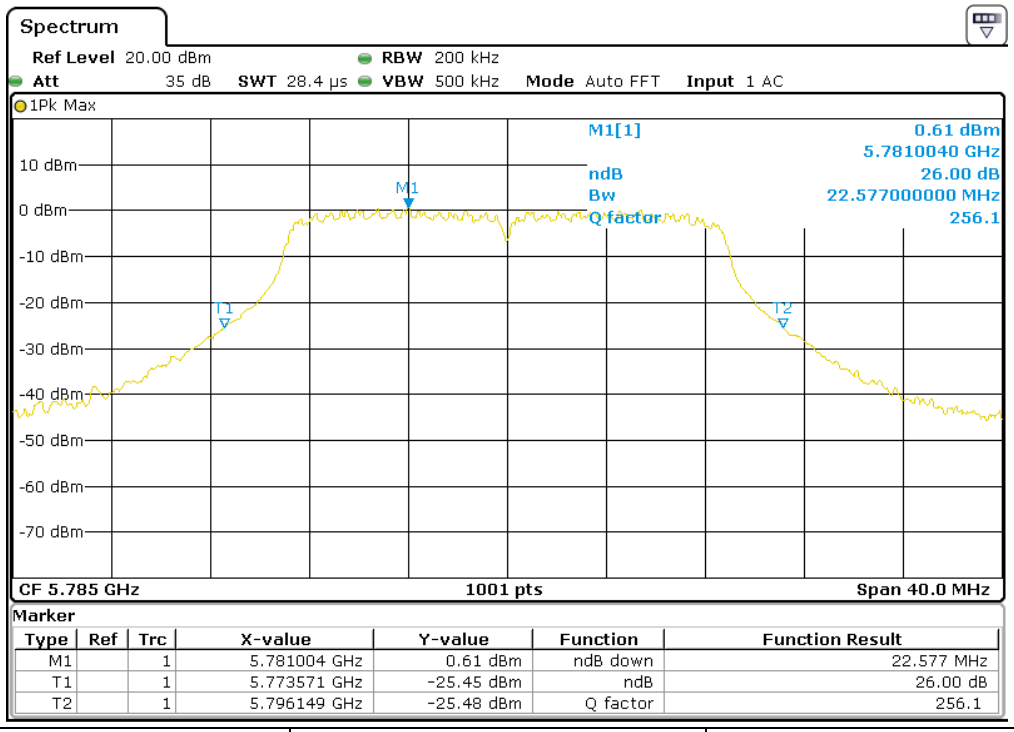
802.11 a	Antenna A	Channel 165



802.11 n(HT20)	Antenna A	Channel 149



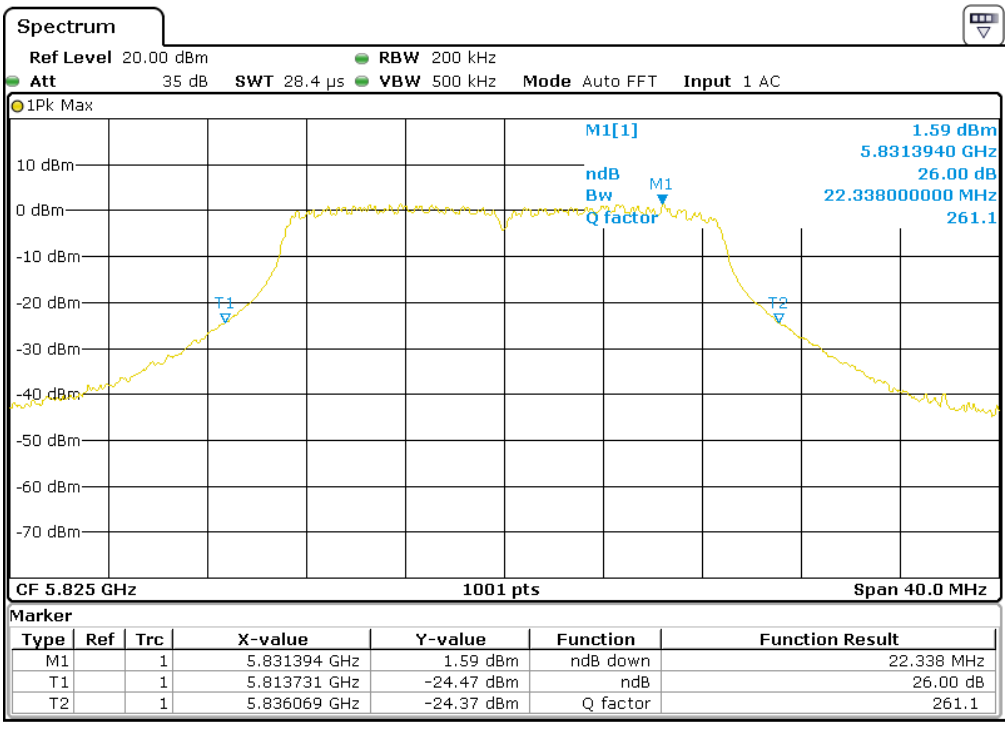
802.11 n(HT20)	Antenna A	Channel 157



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.781004 GHz	0.61 dBm	ndB down	22.577 MHz
T1		1	5.773571 GHz	-25.45 dBm	ndB	26.00 dB
T2		1	5.796149 GHz	-25.48 dBm	Q factor	256.1

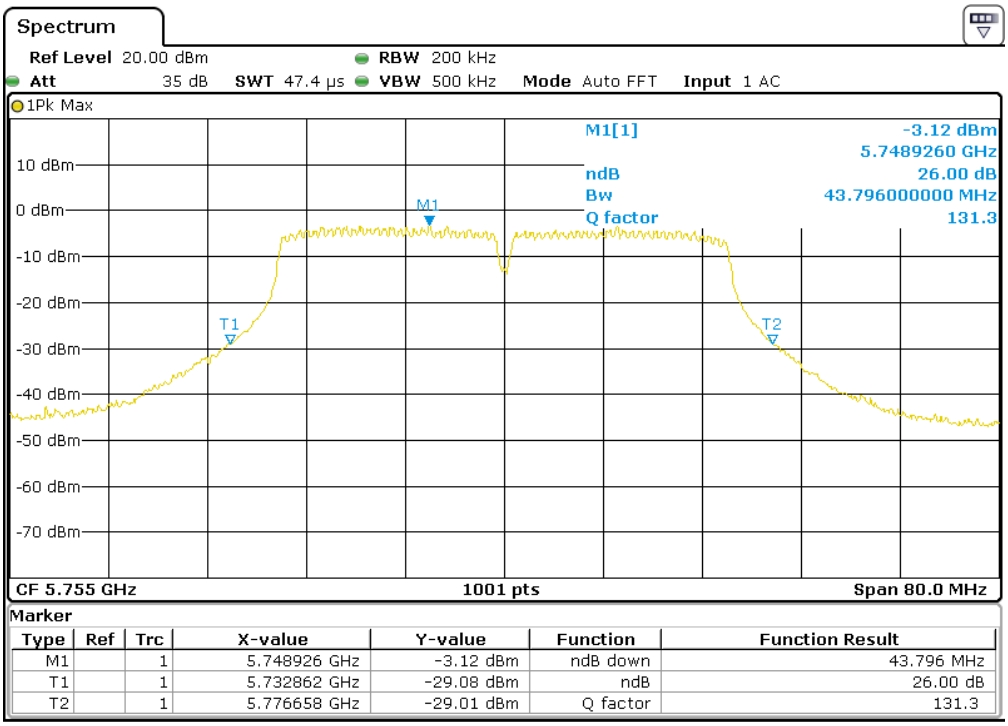
802.11 n(HT20)	Antenna A	Channel 165



Marker

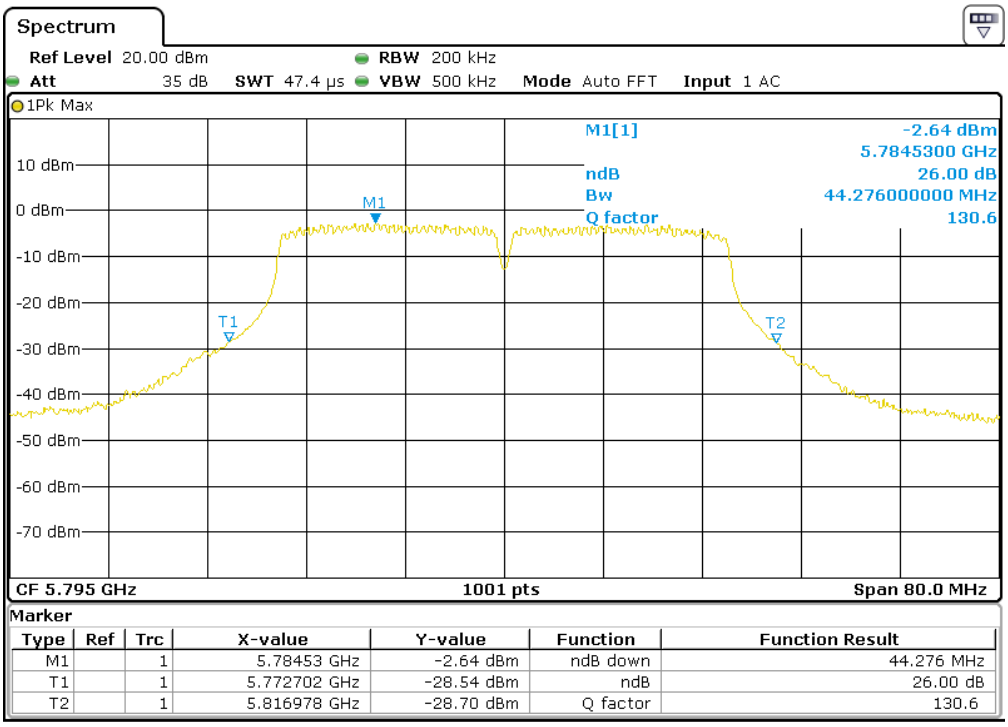
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.831394 GHz	1.59 dBm	ndB down	22.338 MHz
T1		1	5.813731 GHz	-24.47 dBm	ndB	26.00 dB
T2		1	5.836069 GHz	-24.37 dBm	Q factor	261.1

802.11 n(HT40)	Antenna A	Channel 151



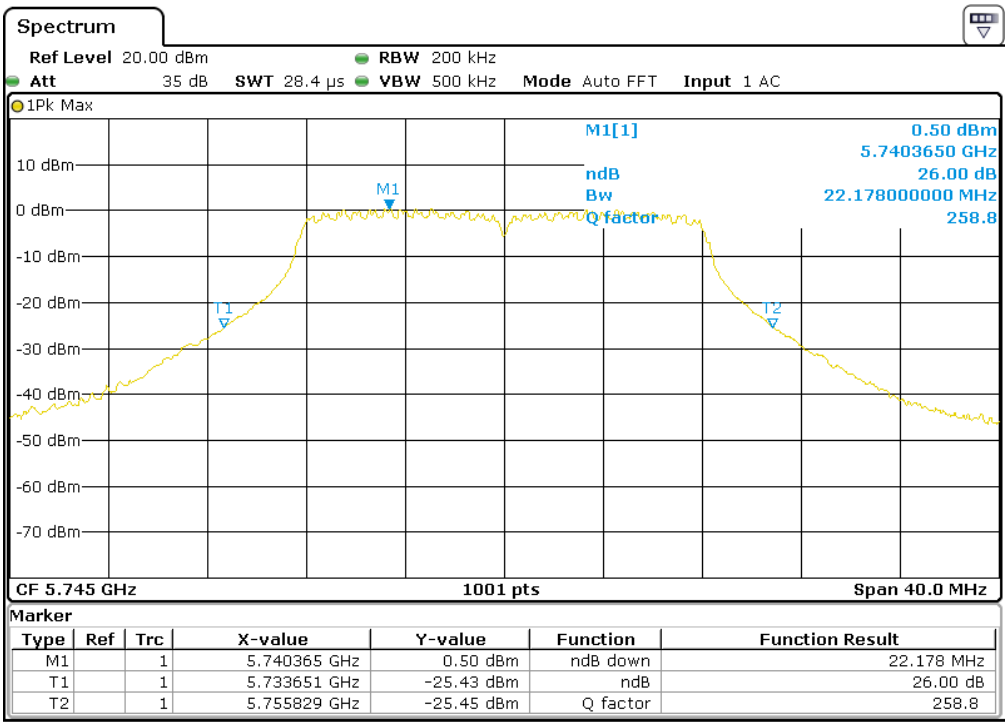
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.748926 GHz	-3.12 dBm	ndB down	43.796 MHz
T1		1	5.732862 GHz	-29.08 dBm	ndB	26.00 dB
T2		1	5.776658 GHz	-29.01 dBm	Q factor	131.3

802.11 n(HT40)	Antenna A	Channel 159



Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.78453 GHz	-2.64 dBm	ndB down	44.276 MHz
T1		1	5.772702 GHz	-28.54 dBm	ndB	26.00 dB
T2		1	5.816978 GHz	-28.70 dBm	Q factor	130.6

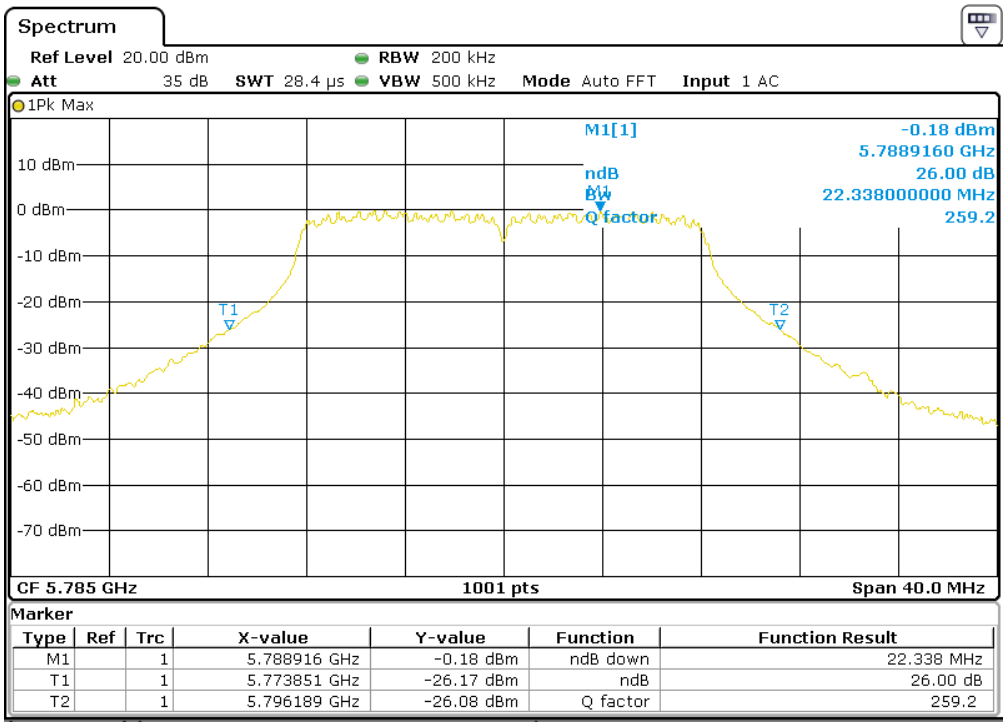
802.11 a	Antenna B	Channel 149



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.740365 GHz	0.50 dBm	ndB down	22.178 MHz
T1		1	5.733651 GHz	-25.43 dBm	ndB	26.00 dB
T2		1	5.755829 GHz	-25.45 dBm	Q factor	258.8

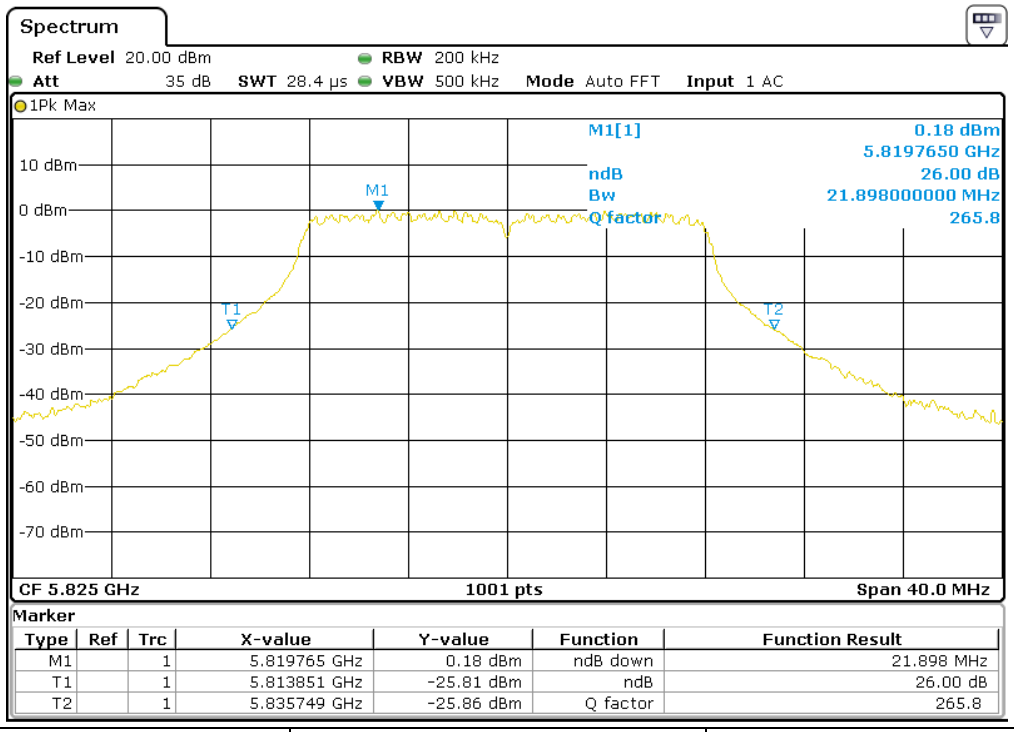
802.11 a	Antenna B	Channel 157



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.788916 GHz	-0.18 dBm	ndB down	22.338 MHz
T1		1	5.773851 GHz	-26.17 dBm	ndB	26.00 dB
T2		1	5.796189 GHz	-26.08 dBm	Q factor	259.2

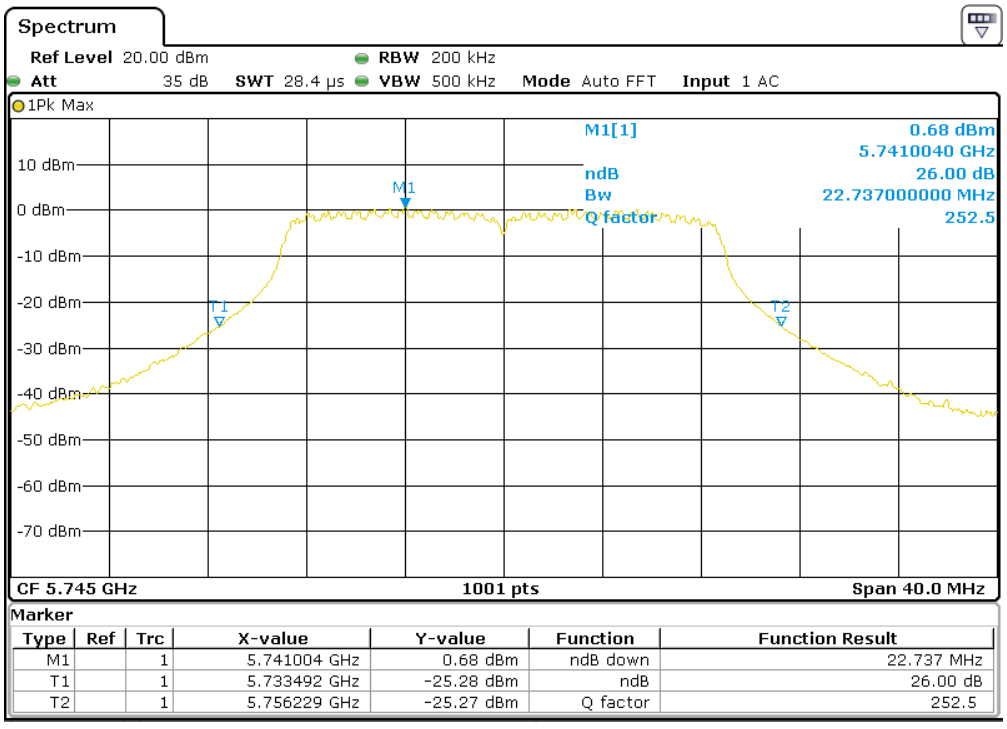
802.11 a	Antenna B	Channel 165



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.819765 GHz	0.18 dBm	ndB down	21.898 MHz
T1		1	5.813851 GHz	-25.81 dBm	ndB	26.00 dB
T2		1	5.835749 GHz	-25.86 dBm	Q factor	265.8

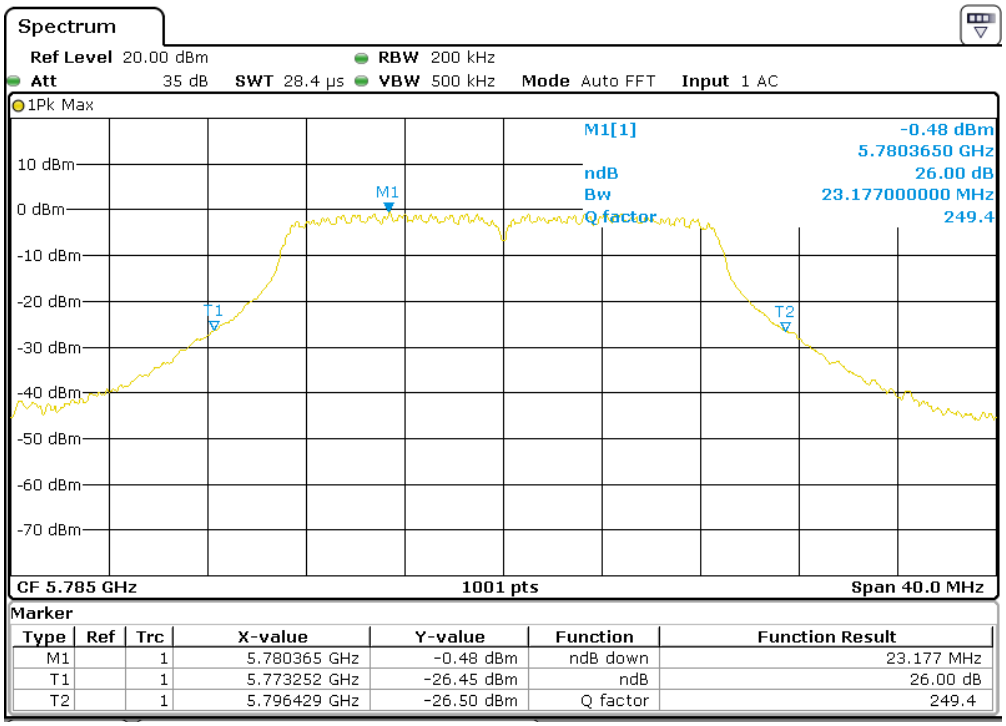
802.11 n(HT20)	Antenna B	Channel 149



Marker

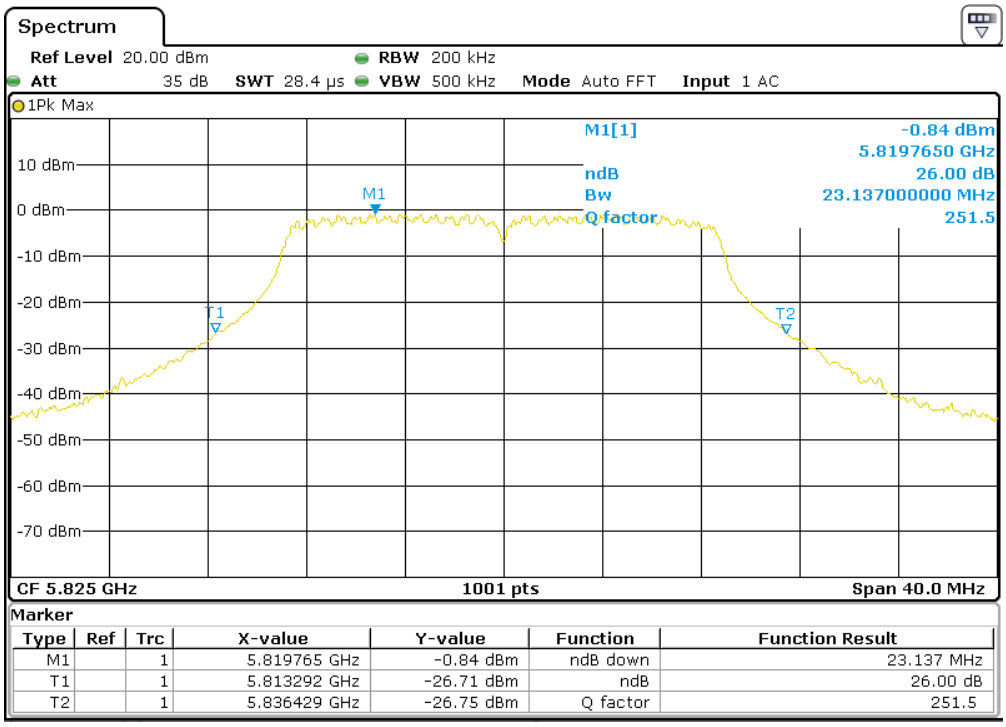
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.741004 GHz	0.68 dBm	ndB down	22.737 MHz
T1		1	5.733492 GHz	-25.28 dBm	ndB	26.00 dB
T2		1	5.756229 GHz	-25.27 dBm	Q factor	252.5

802.11 n(HT20)	Antenna B	Channel 157



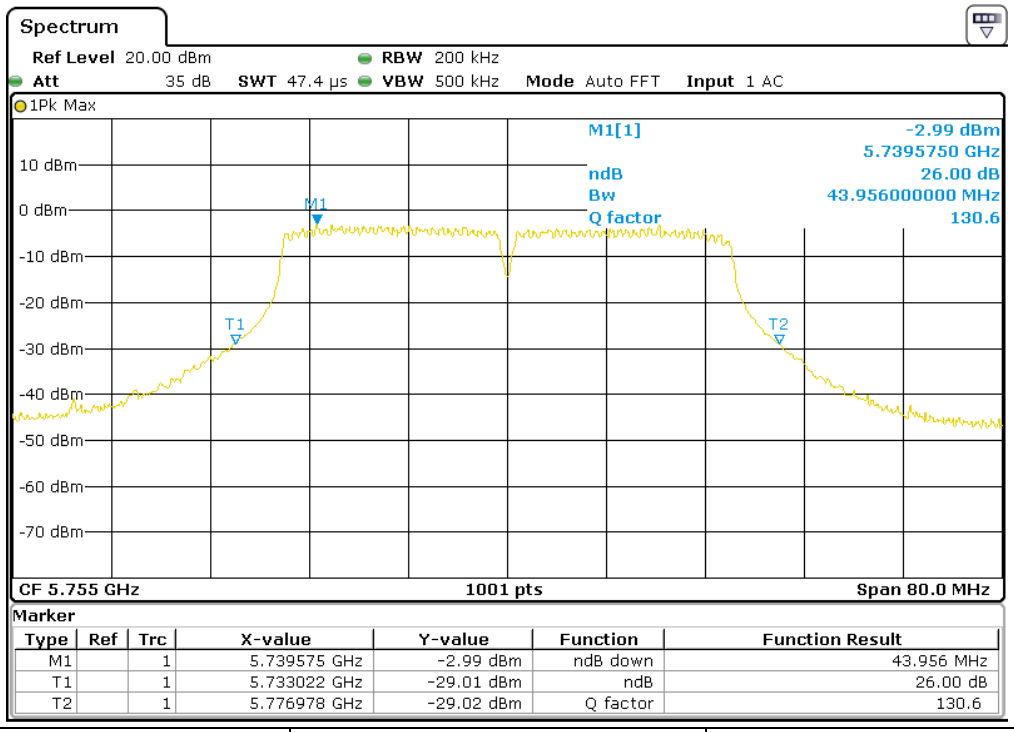
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.780365 GHz	-0.48 dBm	ndB down	23.177 MHz
T1		1	5.773252 GHz	-26.45 dBm	ndB	26.00 dB
T2		1	5.796429 GHz	-26.50 dBm	Q factor	249.4

802.11 n(HT20)	Antenna B	Channel 165



Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.819765 GHz	-0.84 dBm	ndB down	23.137 MHz
T1		1	5.813292 GHz	-26.71 dBm	ndB	26.00 dB
T2		1	5.836429 GHz	-26.75 dBm	Q factor	251.5

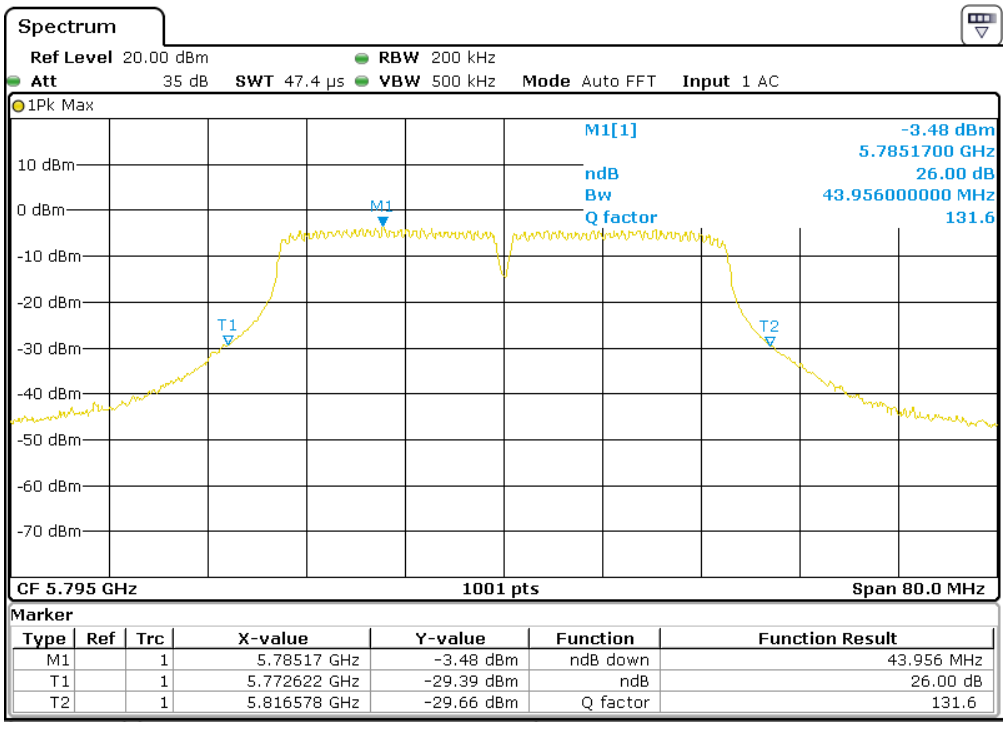
802.11 n(HT40)	Antenna B	Channel 151



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.739575 GHz	-2.99 dBm	ndB down	43.956 MHz
T1		1	5.733022 GHz	-29.01 dBm	ndB	26.00 dB
T2		1	5.776978 GHz	-29.02 dBm	Q factor	130.6

802.11 n(HT40)	Antenna B	Channel 159

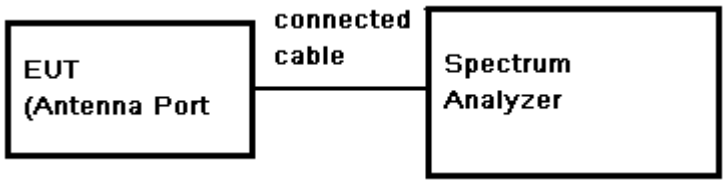


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.78517 GHz	-3.48 dBm	ndB down	43.956 MHz
T1		1	5.772622 GHz	-29.39 dBm	ndB	26.00 dB
T2		1	5.816578 GHz	-29.66 dBm	Q factor	131.6

7.6 Minimum 6 dB bandwidth

Test Configuration:



Test Procedure:

a) Place the EUT on the table and set it in transmitting mode.
b) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
c) Set the spectrum analyzer as RBW=100KHz, VBW≥3* RBW, Span=40/80/160MHz, Sweep=auto couple
d) Mark the peak frequency and –6dB (upper and lower) frequency.
e) Repeat above procedures until all frequency measured was complete.

Limit: ≥ 500 kHz (For 5.725-5.85 GHz band)

Test Result: Pass

Test Data:

For Antenna A:

802.11a			802.11 n(HT20)			802.11n(HT40)		
CH No.	Freq(MHz)	BW (MHz)	CH No.	Freq(MHz)	BW (MHz)	CH No.	Freq(MHz)	BW (MHz)
149	5745	16.613	149	5745	17.742	151	5755	36.603
157	5785	16.623	157	5785	17.742	--	--	--
165	5825	16.543	165	5825	17.742	159	5795	36.523

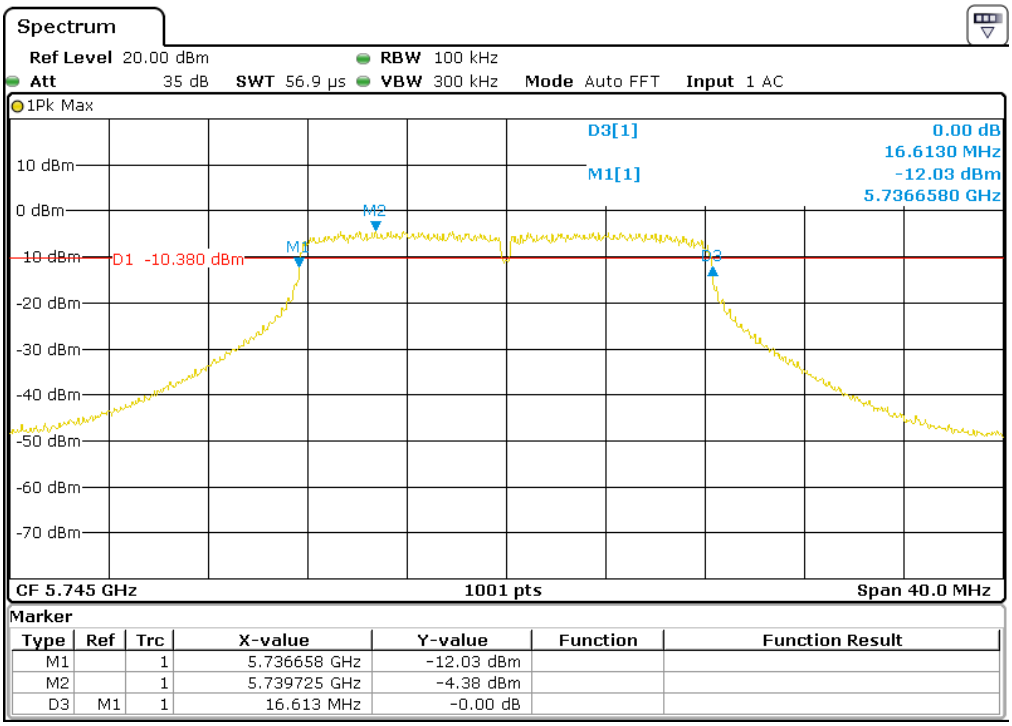
For Antenna B:

802.11a			802.11 n(HT20)			802.11n(HT40)		
CH No.	Freq(MHz)	BW (MHz)	CH No.	Freq(MHz)	BW (MHz)	CH No.	Freq(MHz)	BW (MHz)
149	5745	16.623	149	5745	17.742	151	5755	36.613
157	5785	16.623	157	5785	17.702	--	--	--
165	5825	16.623	165	5825	17.742	159	5795	36.603

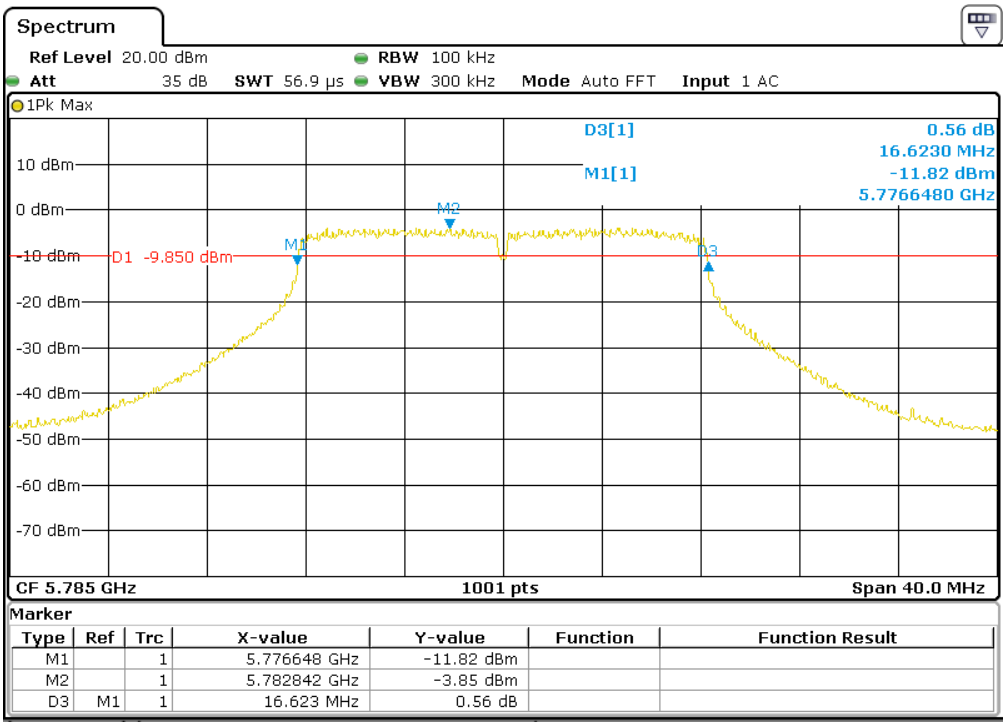
TEST RESULTS: The unit does meet the requirements.

Test plot as follows:

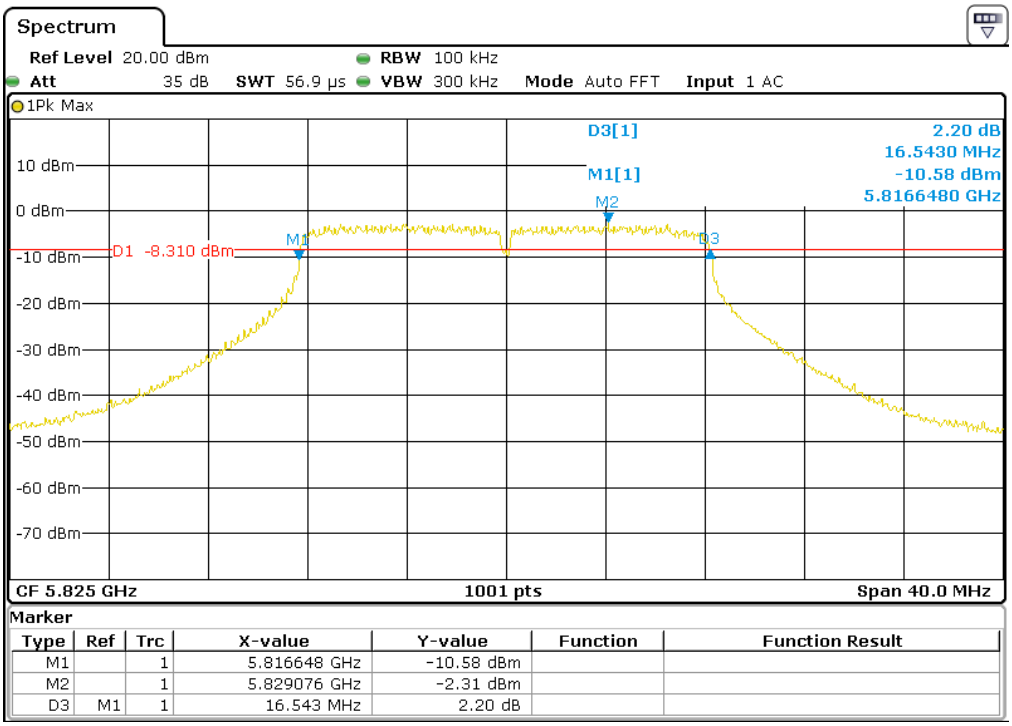
802.11 a	Antenna A	Channel 149



802.11 a	Antenna A	Channel 157



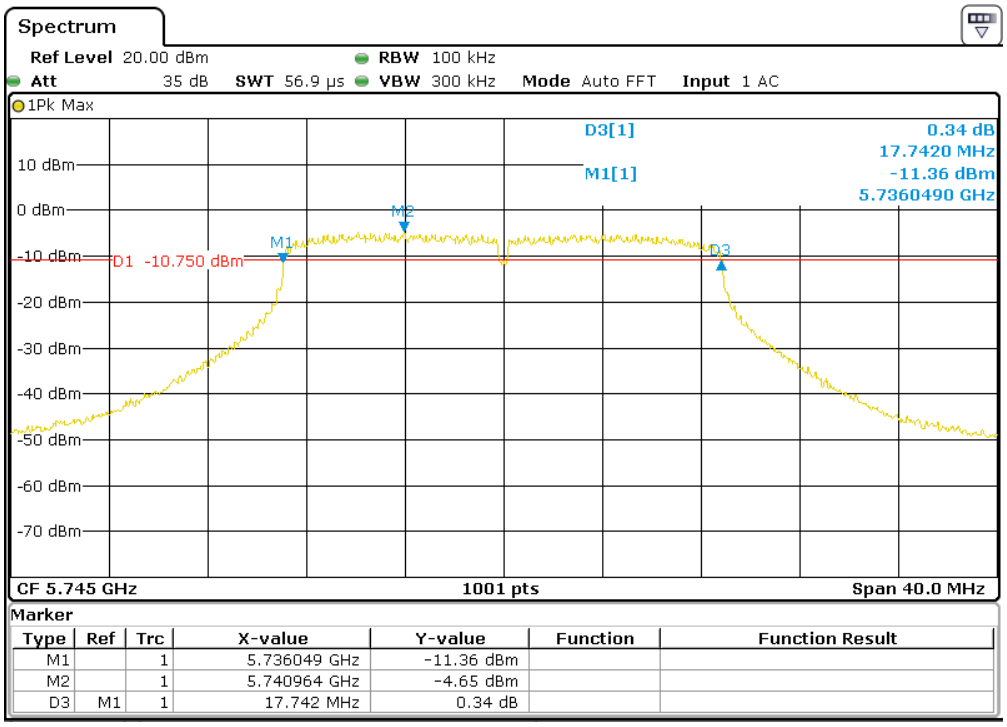
802.11 a	Antenna A	Channel 165



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.816648 GHz	-10.58 dBm		
M2		1	5.829076 GHz	-2.31 dBm		
D3	M1	1	16.543 MHz	2.20 dB		

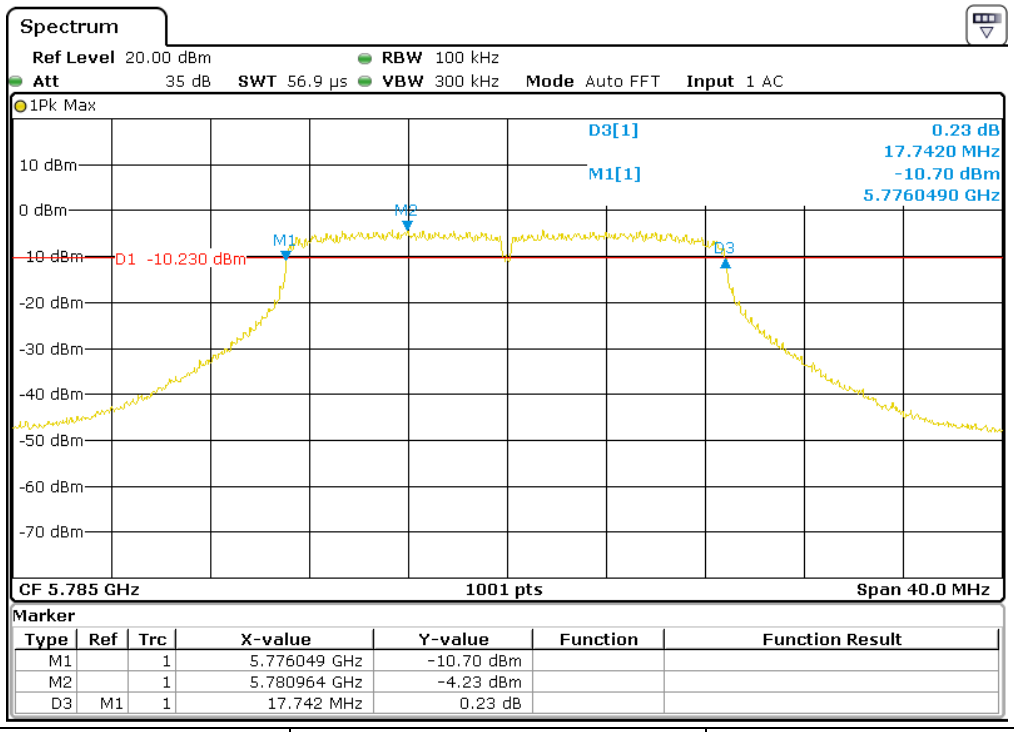
802.11 n(HT20)	Antenna A	Channel 149



Marker

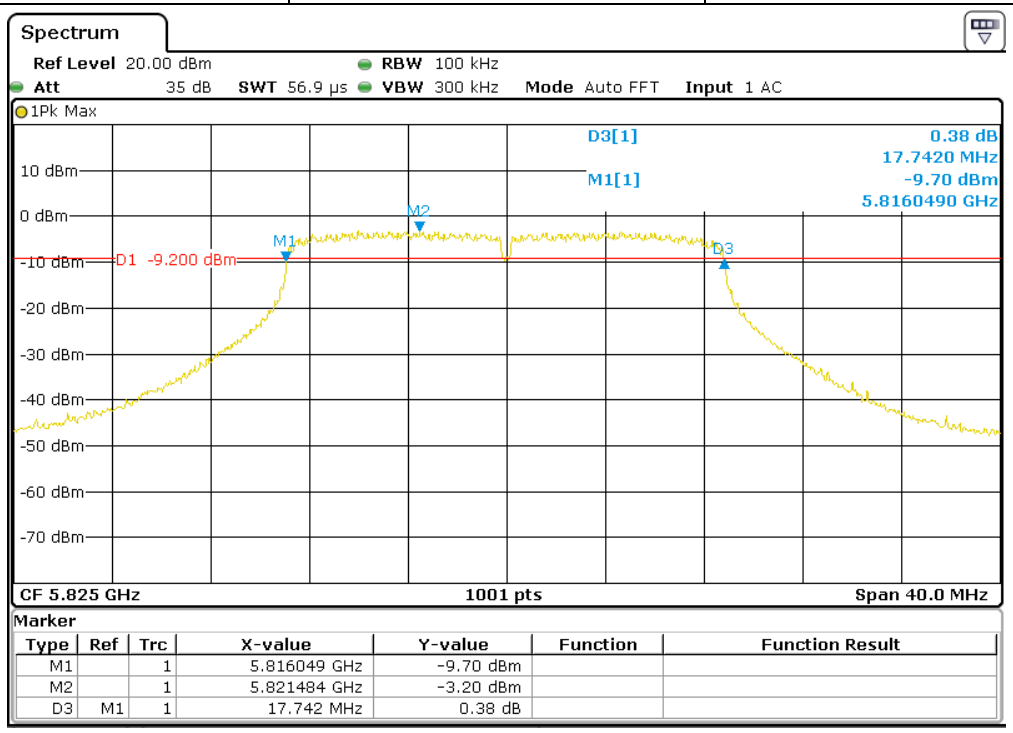
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.736049 GHz	-11.36 dBm		
M2		1	5.740964 GHz	-4.65 dBm		
D3	M1	1	17.742 MHz	0.34 dB		

802.11 n(HT20)	Antenna A	Channel 157



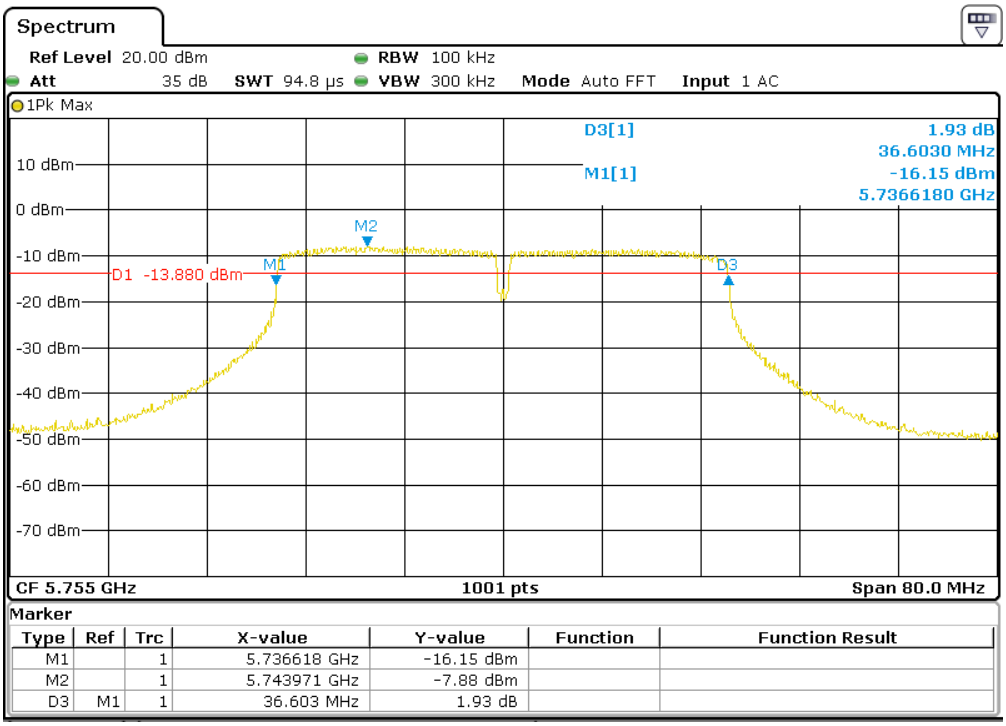
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.776049 GHz	-10.70 dBm		
M2		1	5.780964 GHz	-4.23 dBm		
D3	M1	1	17.742 MHz	0.23 dB		

802.11 n(HT20)	Antenna A	Channel 165



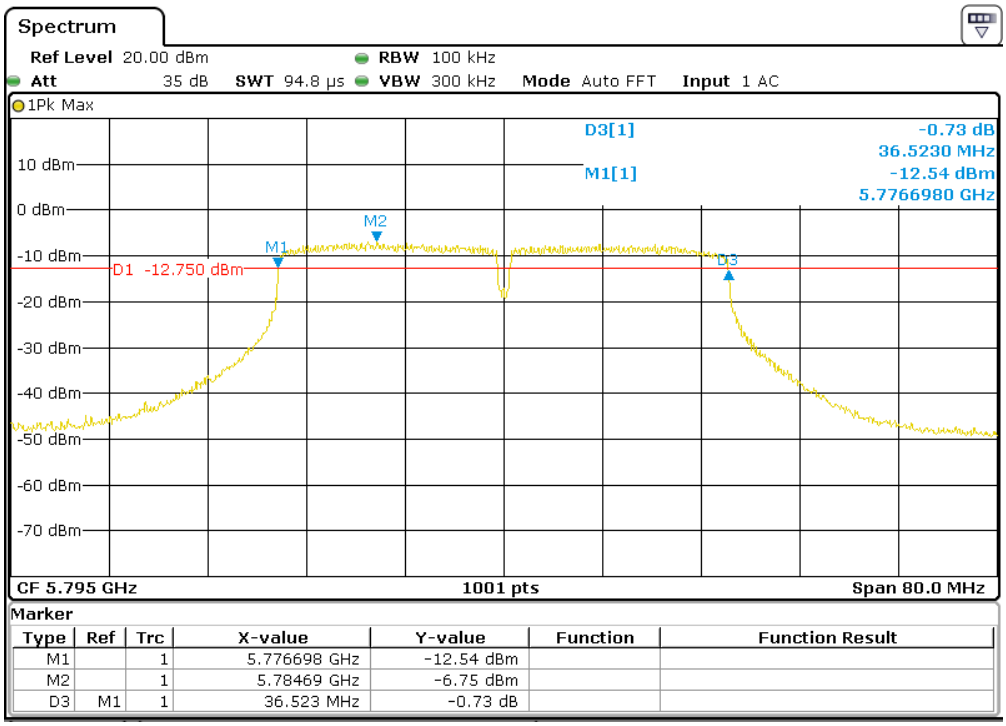
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.816049 GHz	-9.70 dBm		
M2		1	5.821484 GHz	-3.20 dBm		
D3	M1	1	17.742 MHz	0.38 dB		

802.11 n(HT40)	Antenna A	Channel 151



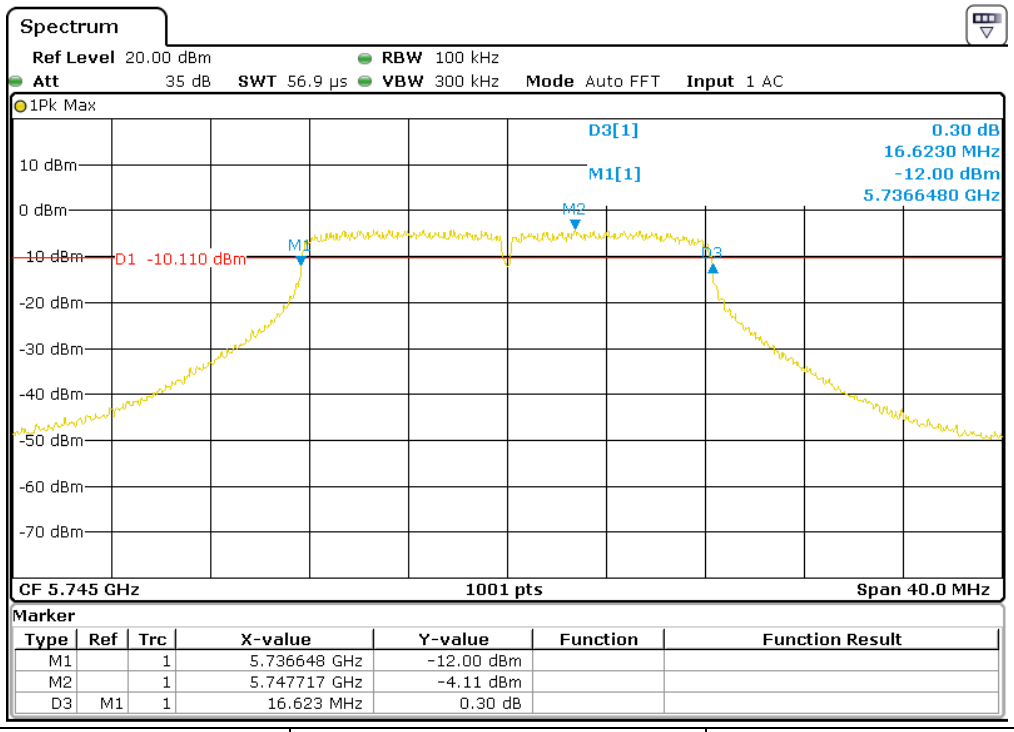
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.736618 GHz	-16.15 dBm		
M2		1	5.743971 GHz	-7.88 dBm		
D3	M1	1	36.603 MHz	1.93 dB		

802.11 n(HT40)	Antenna A	Channel 159



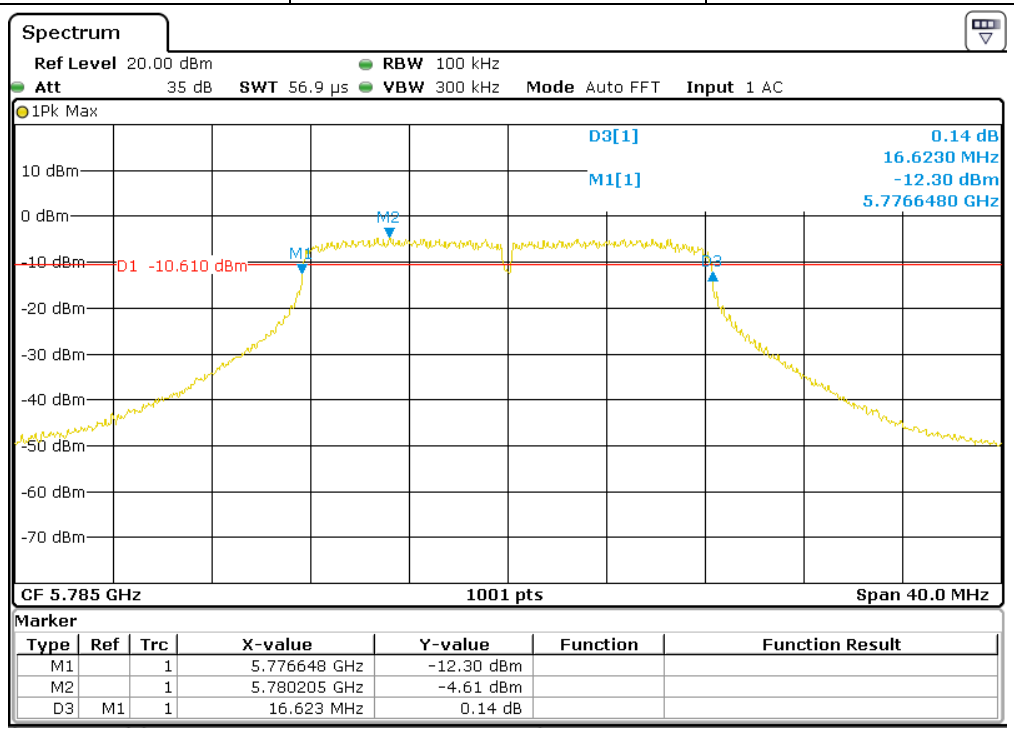
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.776698 GHz	-12.54 dBm		
M2		1	5.78469 GHz	-6.75 dBm		
D3	M1	1	36.523 MHz	-0.73 dB		

802.11 a	Antenna B	Channel 149



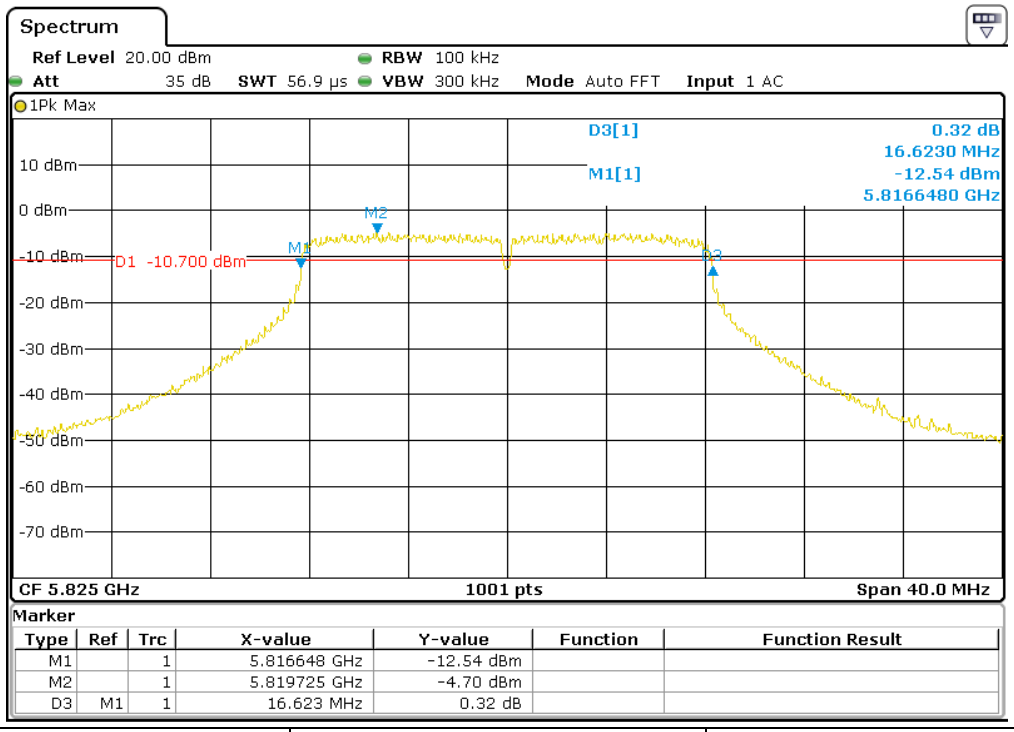
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.736648 GHz	-12.00 dBm		
M2		1	5.747717 GHz	-4.11 dBm		
D3	M1	1	16.623 MHz	0.30 dB		

802.11 a	Antenna B	Channel 157



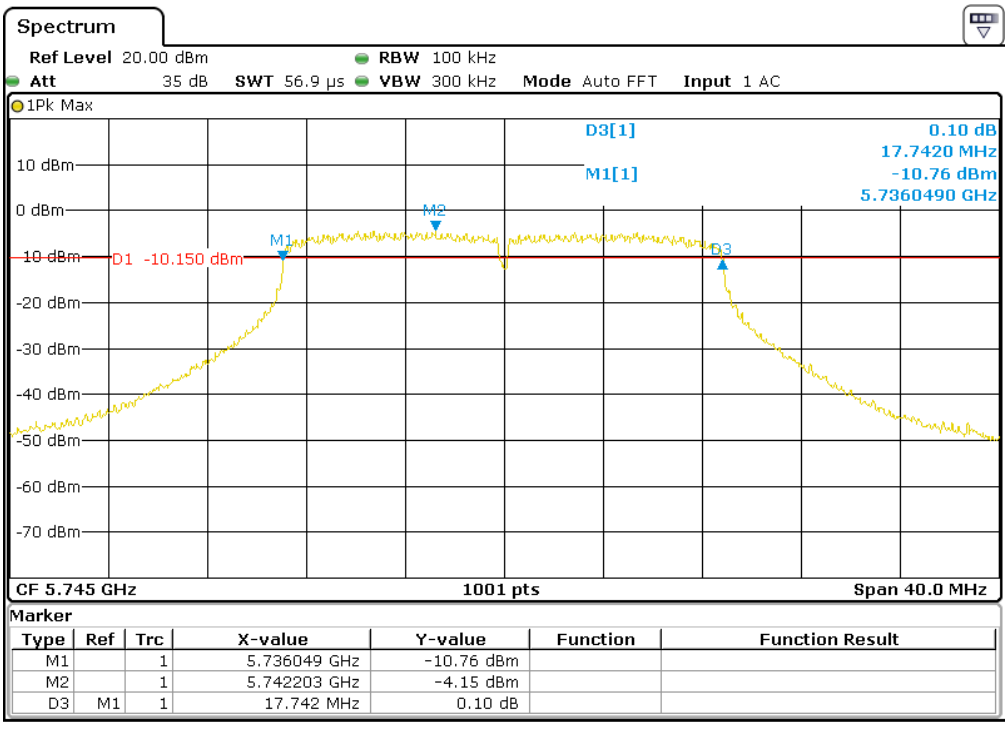
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.776648 GHz	-12.30 dBm		
M2		1	5.780205 GHz	-4.61 dBm		
D3	M1	1	16.623 MHz	0.14 dB		

802.11 a	Antenna B	Channel 165



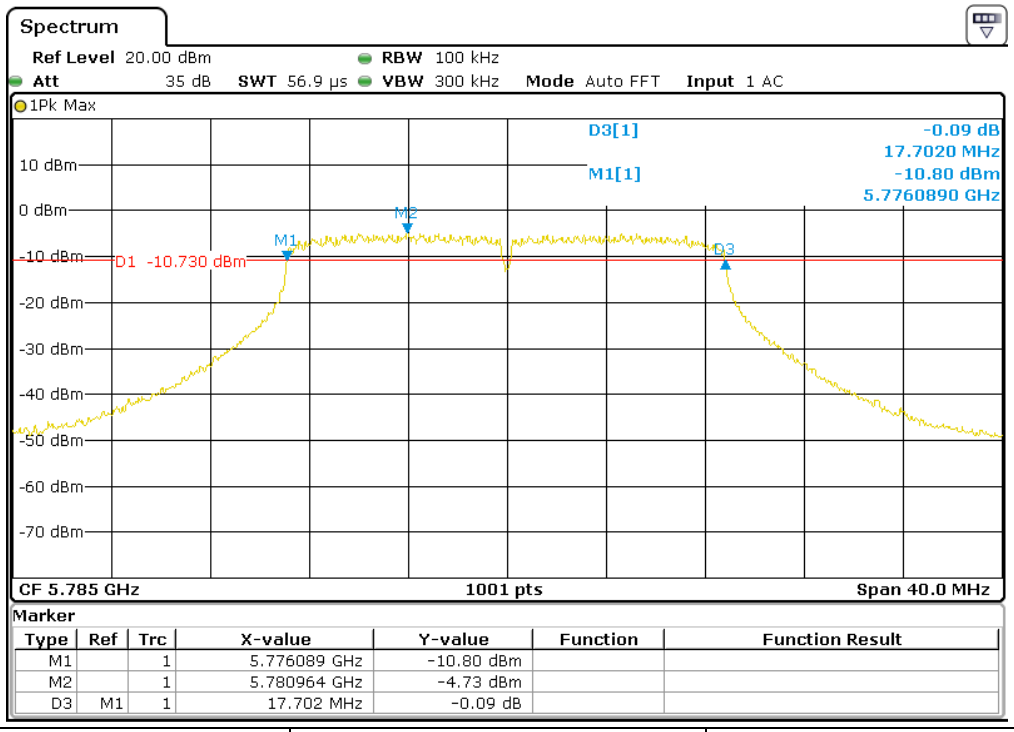
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.816648 GHz	-12.54 dBm		
M2		1	5.819725 GHz	-4.70 dBm		
D3	M1	1	16.623 MHz	0.32 dB		

802.11 n(HT20)	Antenna B	Channel 149

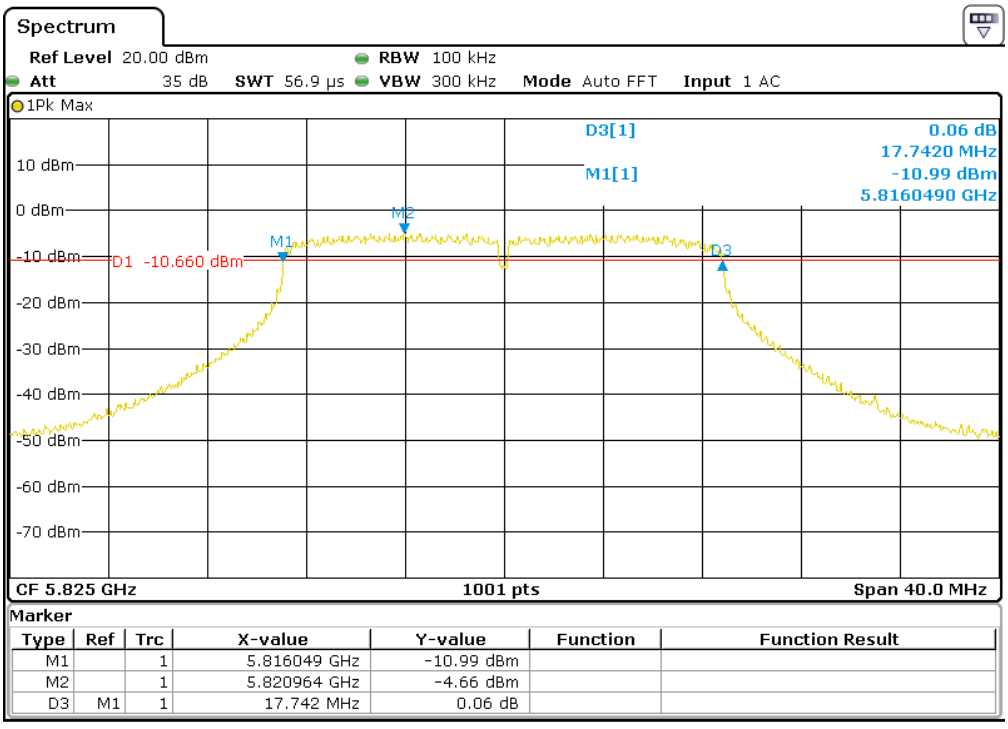


Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.736049 GHz	-10.76 dBm		
M2		1	5.742203 GHz	-4.15 dBm		
D3	M1	1	17.742 MHz	0.10 dB		

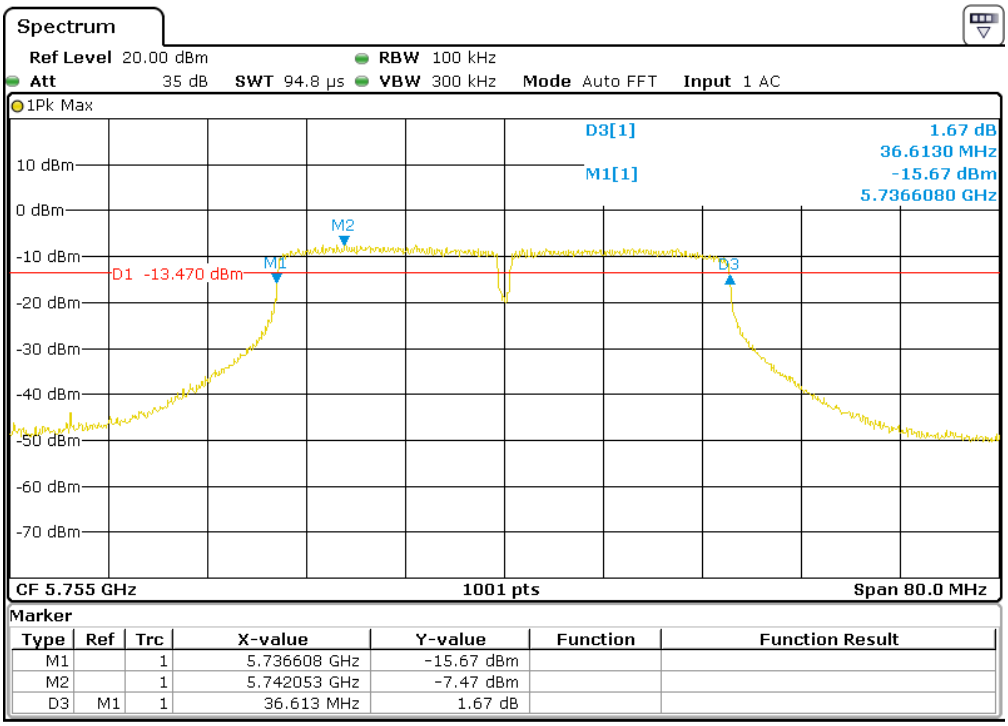
802.11 n(HT20)	Antenna B	Channel 157



802.11 n(HT20)	Antenna B	Channel 165

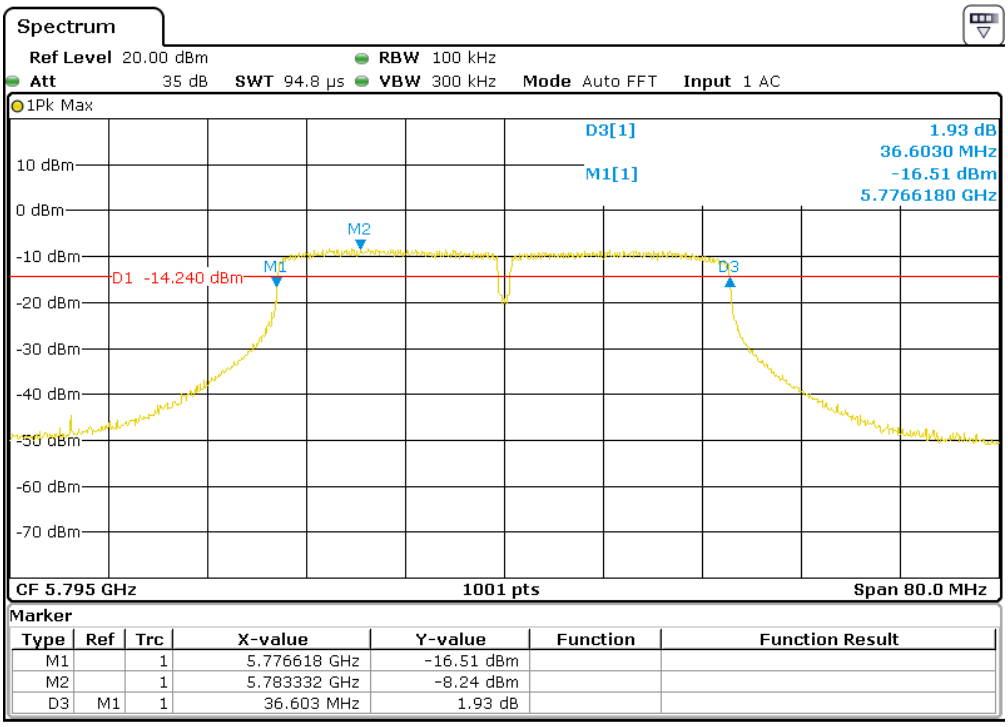


802.11 n(HT40)	Antenna B	Channel 151



Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.736608 GHz	-15.67 dBm		
M2		1	5.742053 GHz	-7.47 dBm		
D3	M1	1	36.613 MHz	1.67 dB		

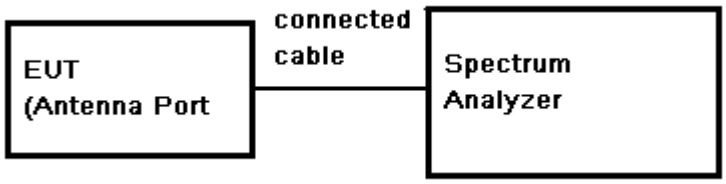
802.11 n(HT40)	Antenna B	Channel 159



Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.776618 GHz	-16.51 dBm		
M2		1	5.783332 GHz	-8.24 dBm		
D3	M1	1	36.603 MHz	1.93 dB		

7.7 Maximum Conducted output power

Test Setup:



Test Procedure:

a) Place the EUT on the table and set it in transmitting mode.
b) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum.
c) Set the spectrum analyzer as RBW=1MHz, VBW≥3* RBW, Span=40/80MHz, Sweep=auto, Detector = RMS
d) Set the occur band to the entire emission 26dB bandwidth of the signal.
e) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
f) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 26dB occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges.
g) Record the max. Power channel reading.
h) Repeat above procedures until all the frequency measured were complete.

Test Limit:

Frequency Band	EUT Category	Limit
U-NII-1	☐ Outdoor Access Point	1W(30dBm) The maximum e.i.r.p≤125 mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon.
	☐ Fixed Point-to-point Access Point	1W(30dBm)
	☐ Indoor Access Point	
	☐ Mobile and Portable client device	250mW (24dBm)
U-NII-2a	-	Lesser of 250mW (24dBm) or 11dBm + 10log B*
U-NII-2c		
U-NII-3		1W (30dBm)
Note: *Where B is the 26dB emission bandwidth in MHz.		

Test Result: Pass

Test Data:

Test Mode	CH No.	Freq (MHz)	Reading (dBm)		Conducted Power (dBm)			Limit (dBm)	Result
			Ant A	Ant B	Ant A	Ant B	MIMO		
802.11a	149	5745	8.53	8.47	9.03	8.97	12.01	30	Pass
	157	5785	9.00	8.01	9.50	8.51	12.04		Pass
	165	5825	10.21	8.06	10.71	8.56	**12.78**		Pass
802.11n (HT20)	149	5745	8.38	8.60	8.88	9.10	12.00	30	Pass
	157	5785	8.89	7.74	9.39	8.24	11.86		Pass
	165	5825	10.16	7.91	10.66	8.41	12.69		Pass
802.11n (HT40)	151	5755	9.74	7.99	10.24	8.49	12.46	30	Pass
	159	5795	9.68	8.45	10.18	8.95	12.62		Pass

Remark:

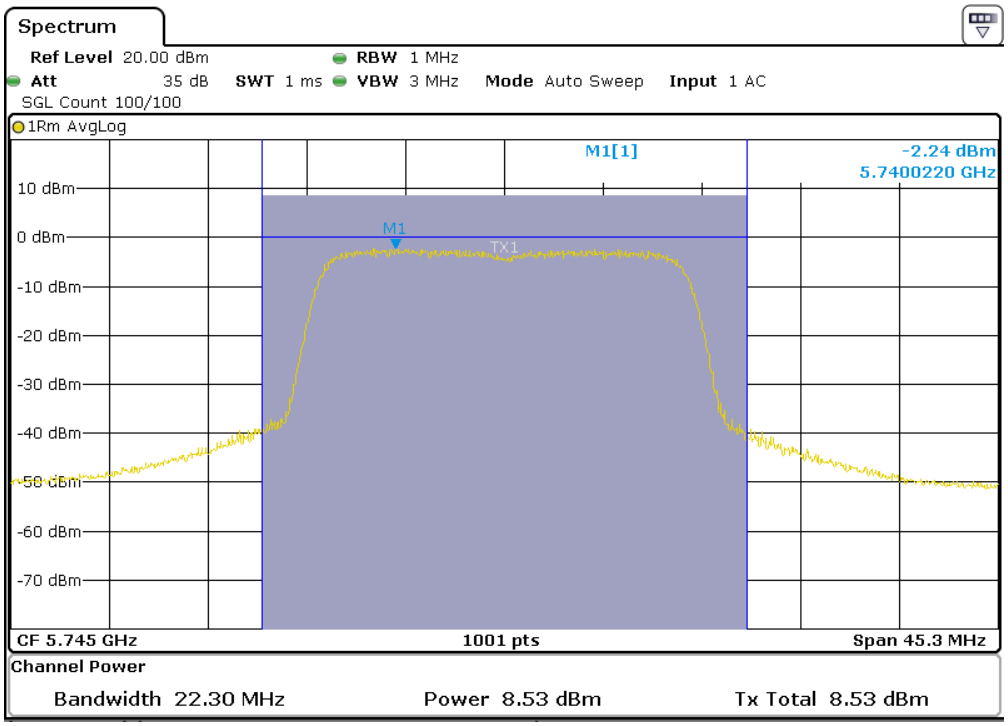
1) Output Peak Power = Reading Power + Cable loss+ Duty Cycle Correction Factor

2) Cable loss= 0.5dB. Duty cycle of test signal is > 98%, duty factor is not required, reference Section 7.4

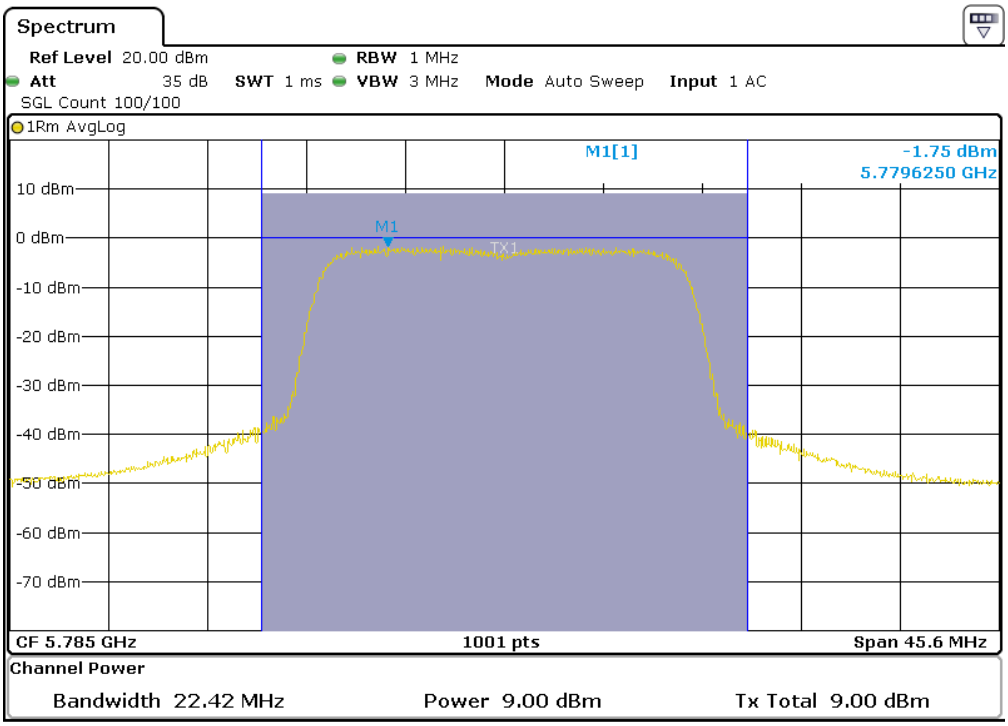
3) Per KDB 662911, the conducted powers at Antenna A and Antenna B were first measured separately during MIMO transmission as shown in section above. The measured values were then summed in linear power units then converted back to dBm.

Test plot as below:

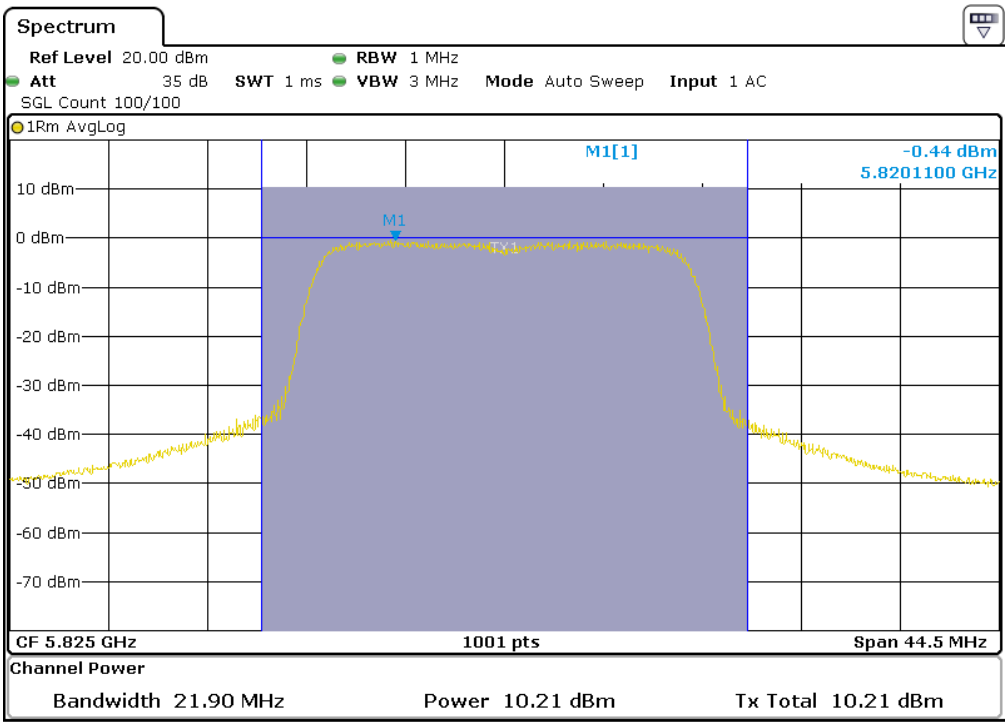
802.11 a	Antenna A	Channel 149



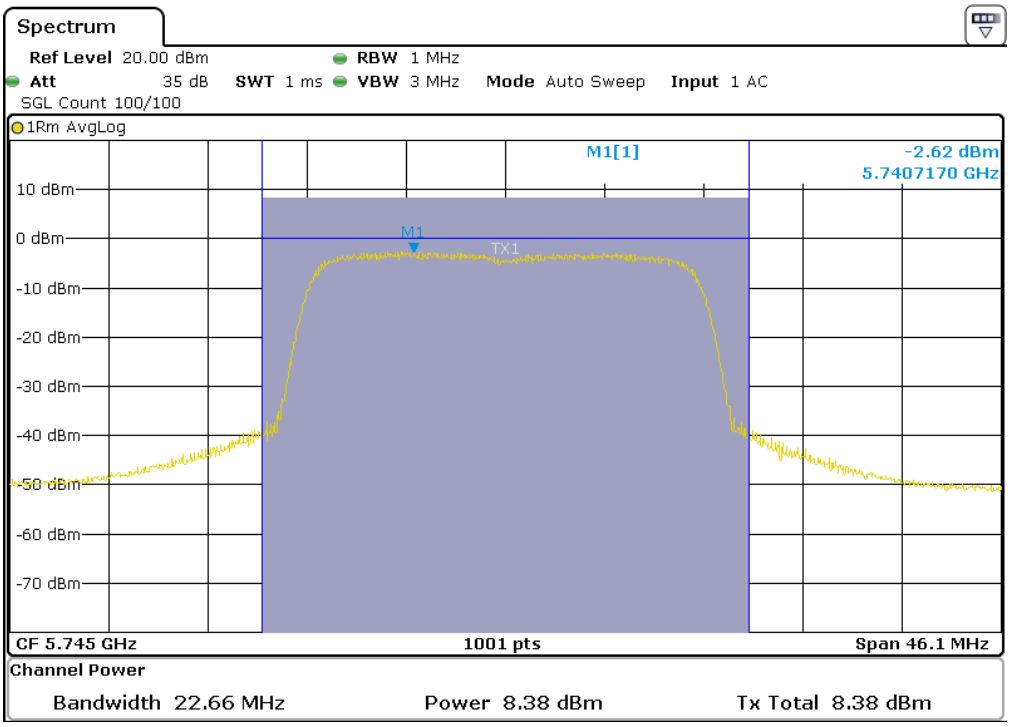
802.11 a	Antenna A	Channel 157



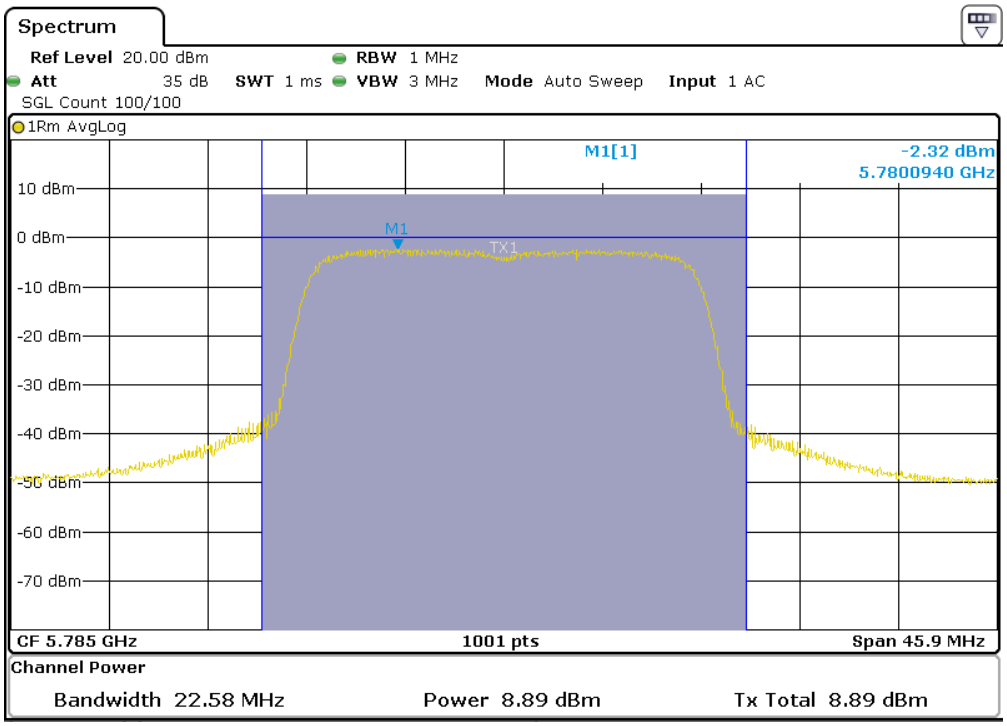
802.11 a	Antenna A	Channel 165



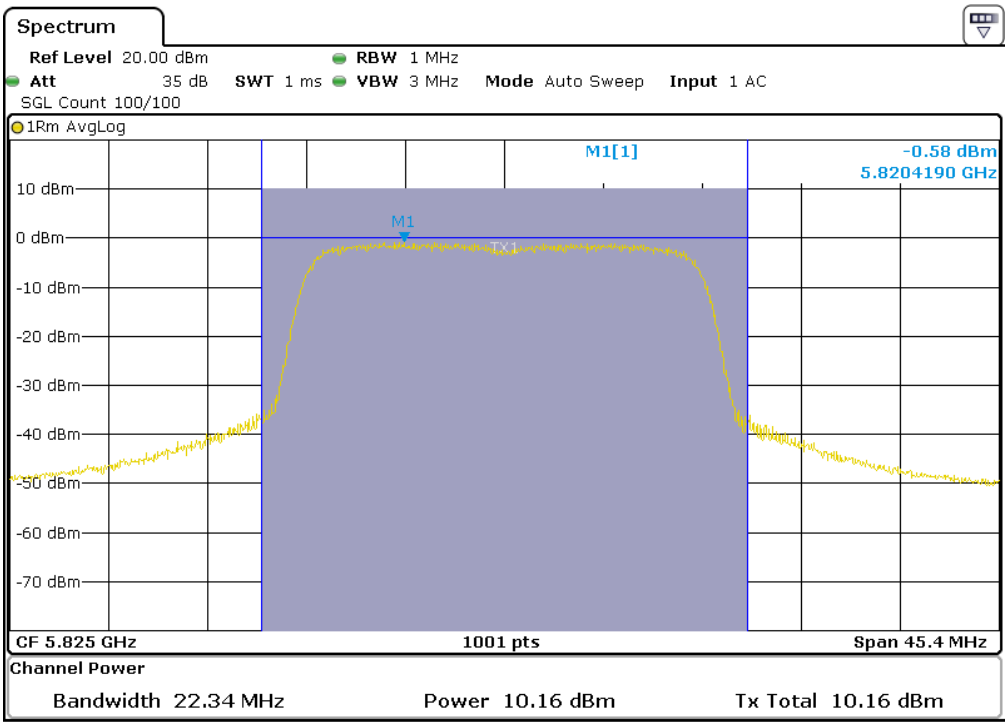
802.11 n(HT20)	Antenna A	Channel 149



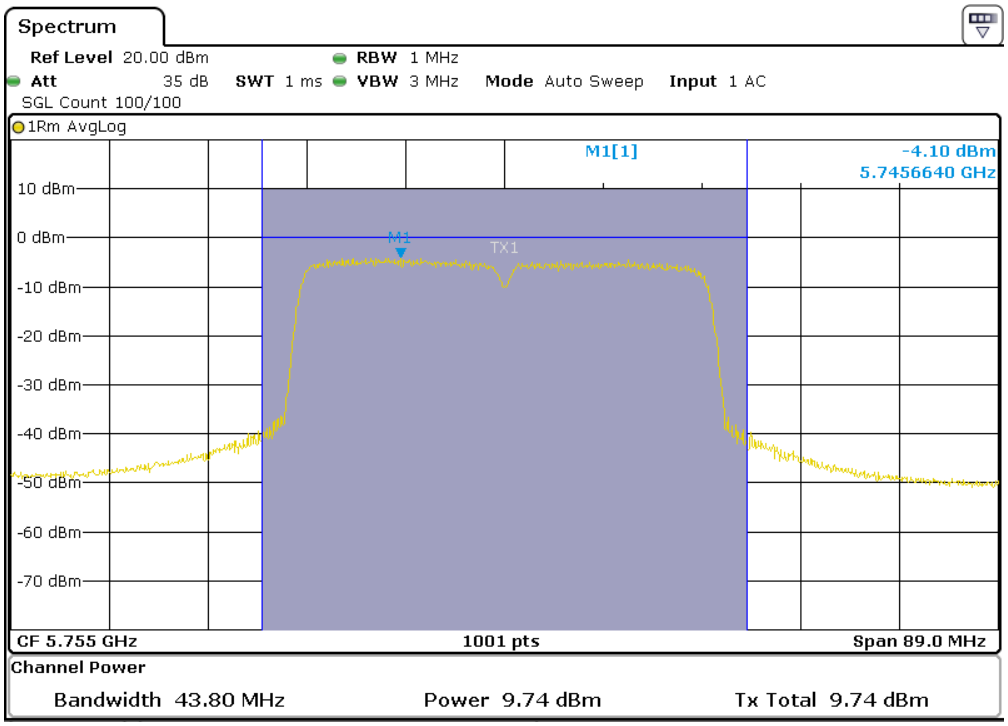
802.11 n(HT20)	Antenna A	Channel 157



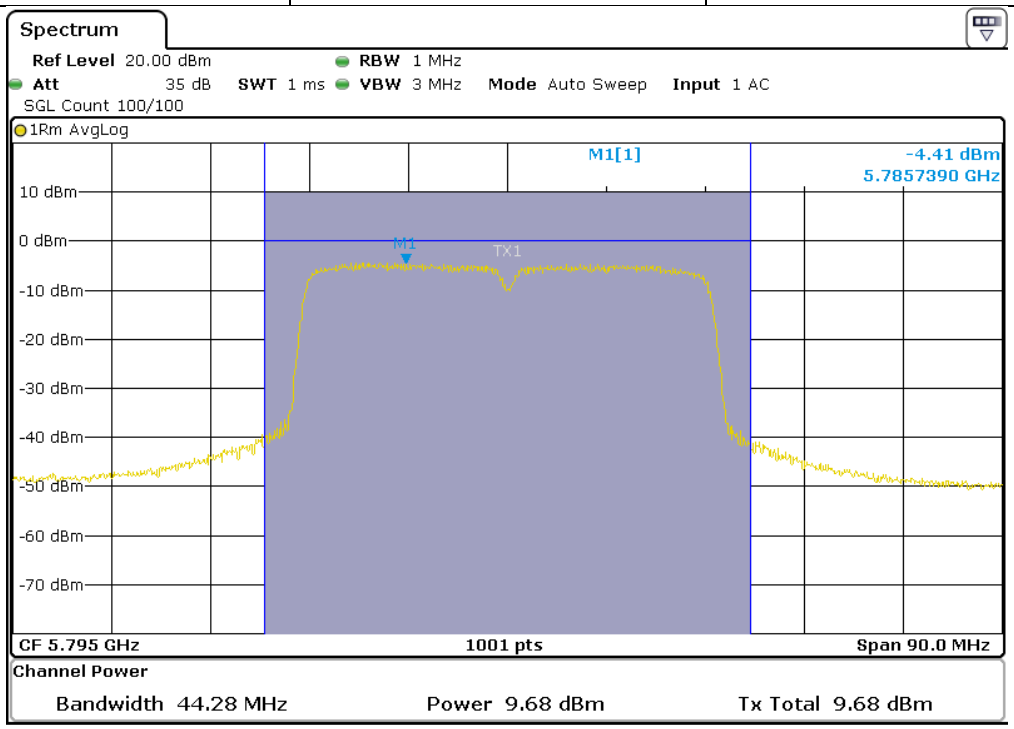
802.11 n(HT20)	Antenna A	Channel 165



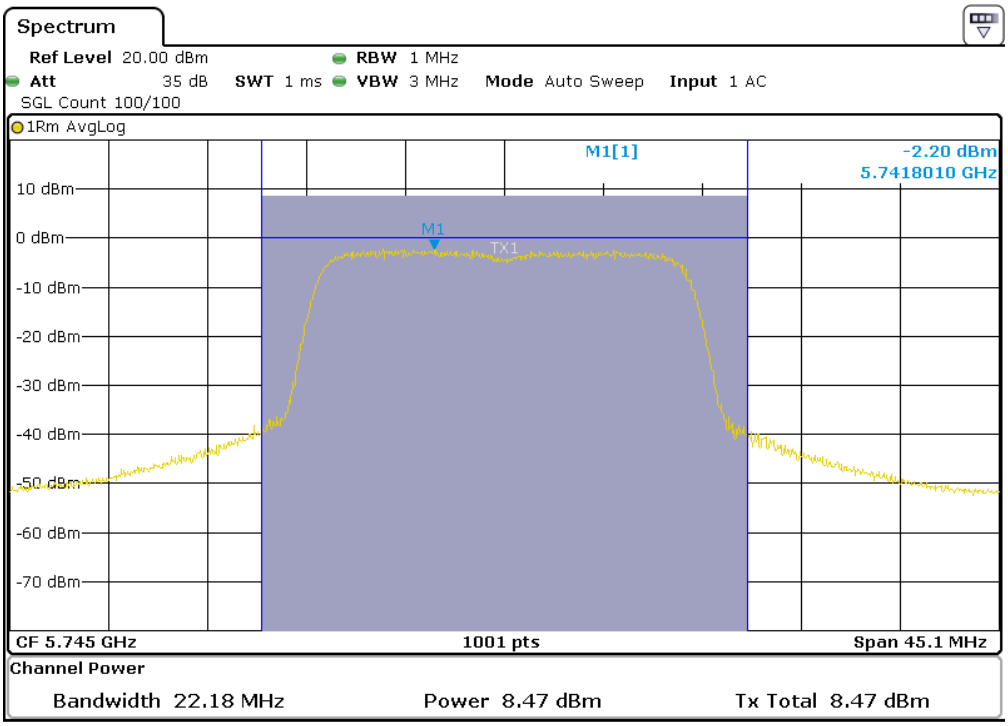
802.11 n(HT40)	Antenna A	Channel 151



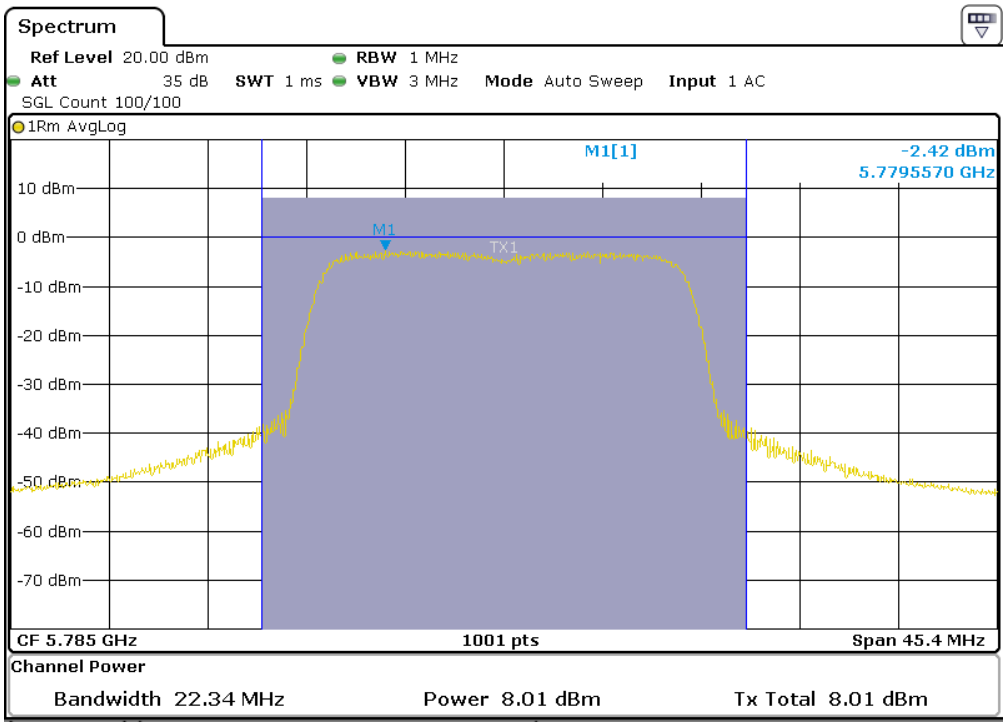
802.11 n(HT40)	Antenna A	Channel 159



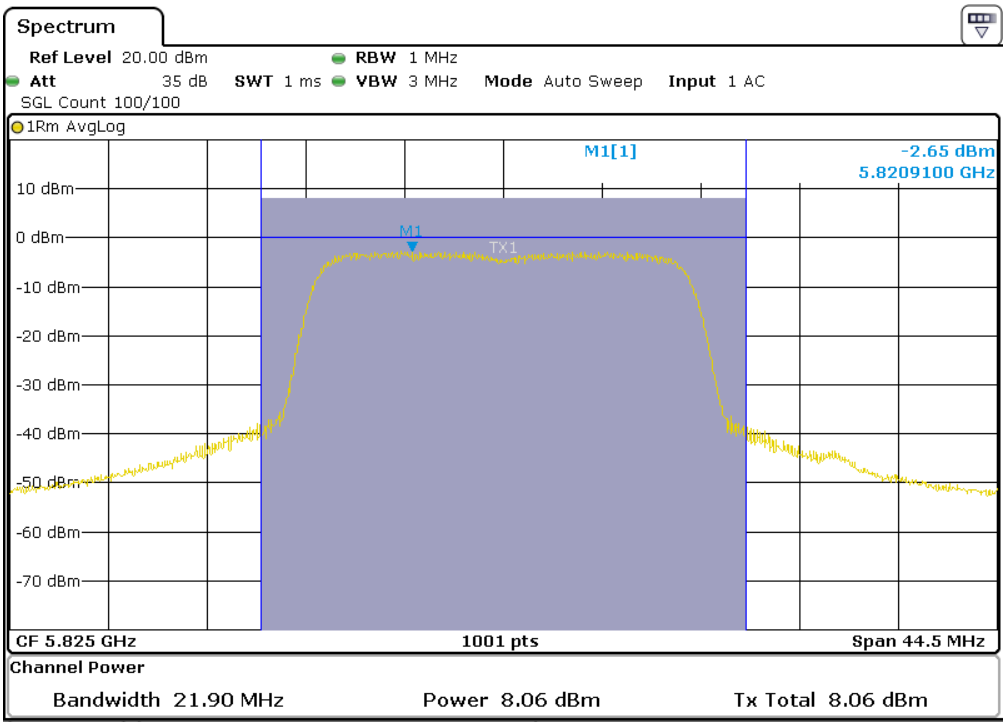
802.11 a	Antenna B	Channel 149



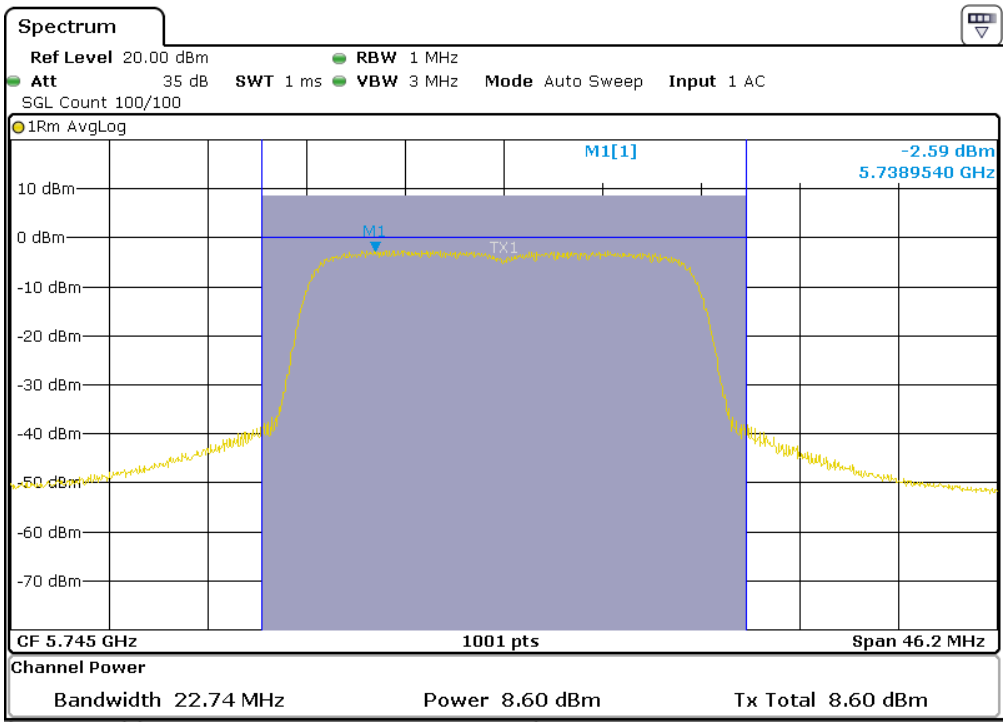
802.11 a	Antenna B	Channel 157



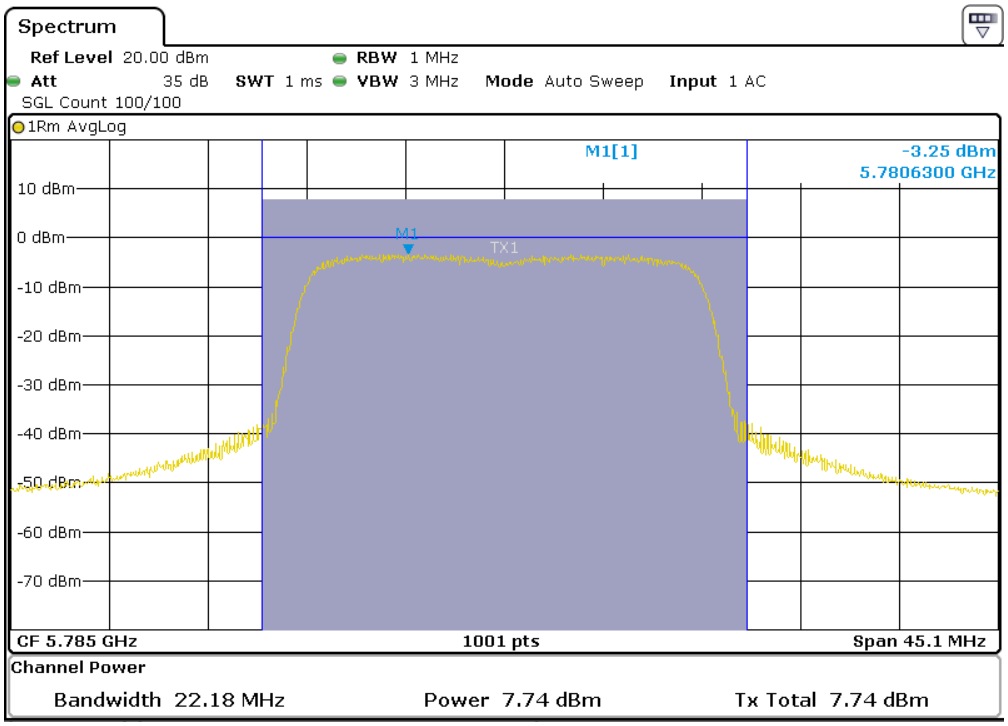
802.11 a	Antenna B	Channel 165



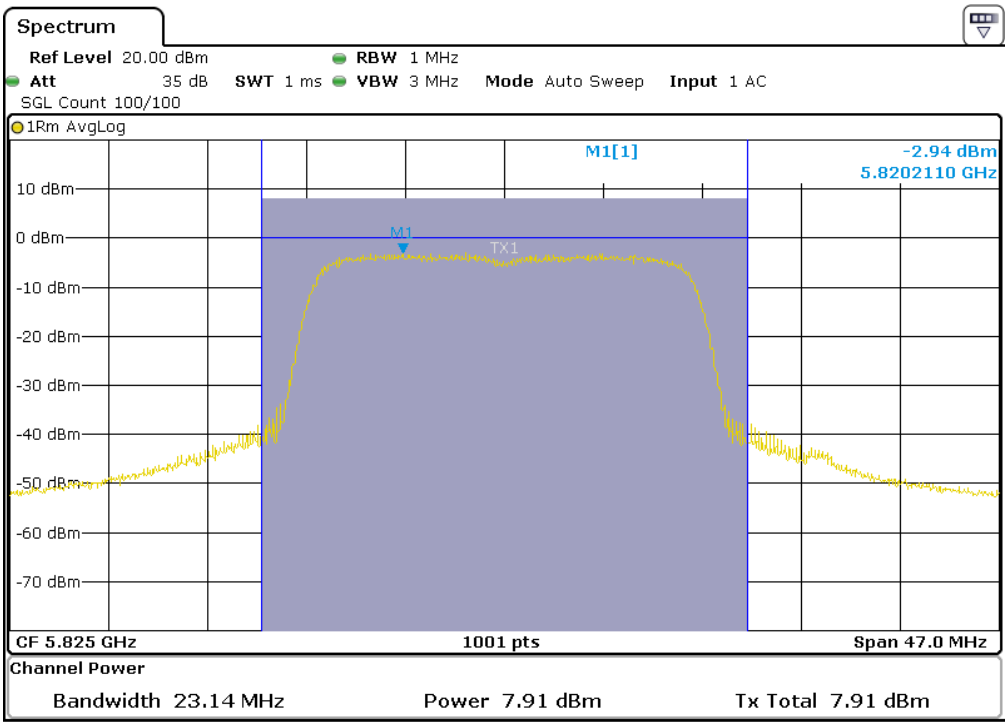
802.11 n(HT20)	Antenna B	Channel 149



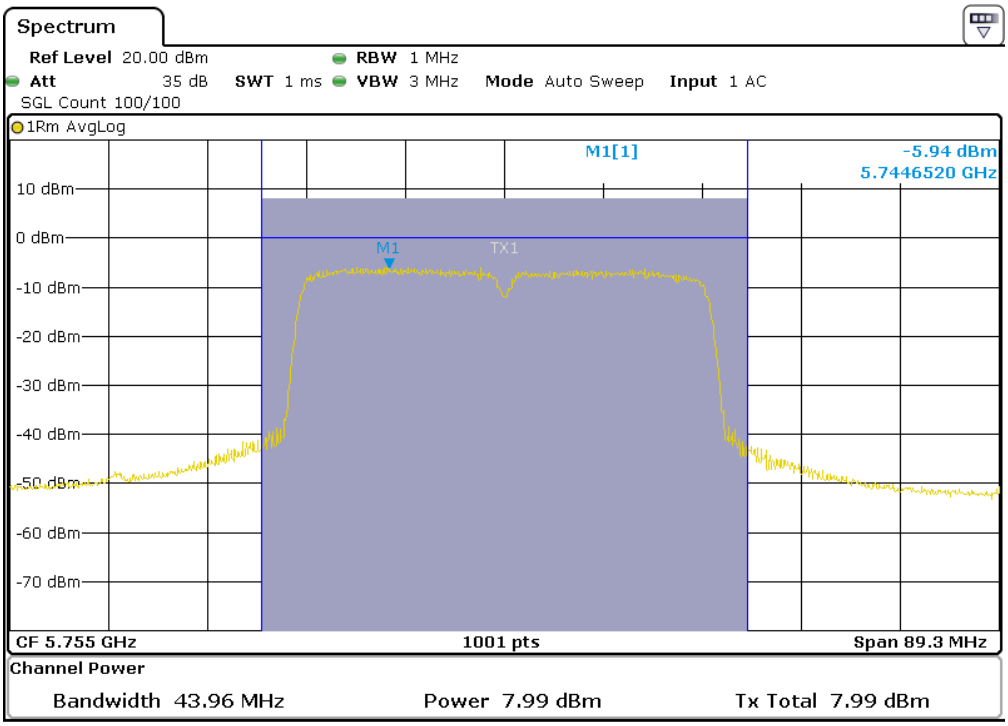
802.11 n(HT20)	Antenna B	Channel 157



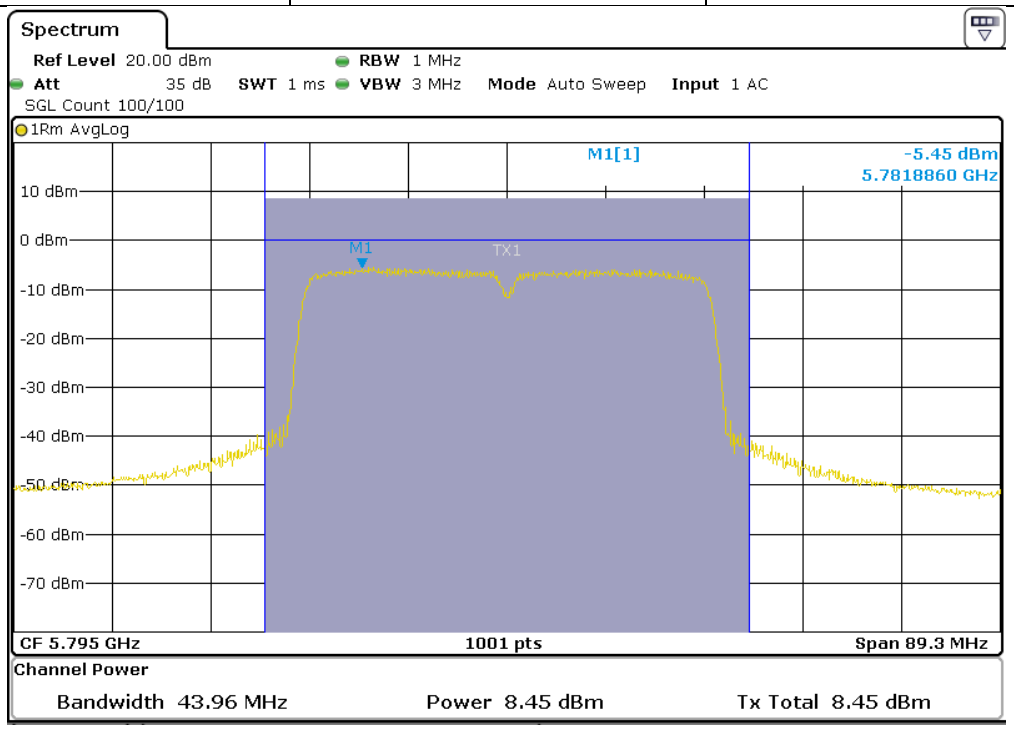
802.11 n(HT20)	Antenna B	Channel 165



802.11 n(HT40)	Antenna B	Channel 151

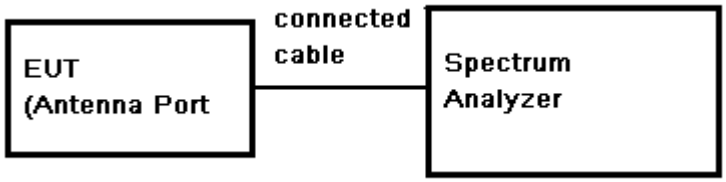


802.11 n(HT40)	Antenna B	Channel 159



7.8 Peak Power Spectral Density

Test Setup:



Test Procedure:

a) Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
b) Set span 40/80/160MHz; RBW = 1 MHz; VBW ≥ 3 MHz.
c) Number of points in sweep ≥ 2 Span / RBW; Sweep time = auto.
d) Detector = RMS, Trigger = Free run Record the marker level for the particular mode.
e) Use the peak search function on the instrument to find the peak of the spectrum and record its value.
f) Repeat these steps for other channel and device modes.

Test Limit:

Frequency Band	EUT Category	Limit
U-NII-1	☐ Outdoor Access Point	17dBm/MHz
	☐ Fixed Point-to-point Access Point	11 dBm/MHz
	☐ Indoor Access Point	
	☐ Mobile and Portable client device	11 dBm/MHz
U-NII-2a	-	11 dBm/MHz
U-NII-2c		
U-NII-3		30 dBm/500KHz

Test Result: Pass

Test Data:

Test Mode	CH No.	Freq (MHz)	Reading (dBm)		PPSD (dBm)			Limit (dBm/500KHz)	Result
			Ant A	Ant B	Ant A	Ant B	MIMO		
802.11a	149	5745	-3.32	-9.67	-2.82	-9.17	-1.91	30	Pass
	157	5785	-5.02	-10.52	-4.52	-10.02	-3.44		Pass
	165	5825	-6.79	-11.05	-6.29	-10.55	-4.91		Pass
802.11n (HT20)	149	5745	-4.01	-9.31	-3.51	-8.81	-2.39	30	Pass
	157	5785	-6.04	-10.73	-5.54	-10.23	-4.27		Pass
	165	5825	-7.23	-11.57	-6.73	-11.07	-5.37		Pass
802.11n (HT40)	151	5755	-7.85	-11.34	-7.35	-10.84	-5.74	30	Pass
	159	5795	-8.54	-11.72	-8.04	-11.22	-6.33		Pass

Remark:

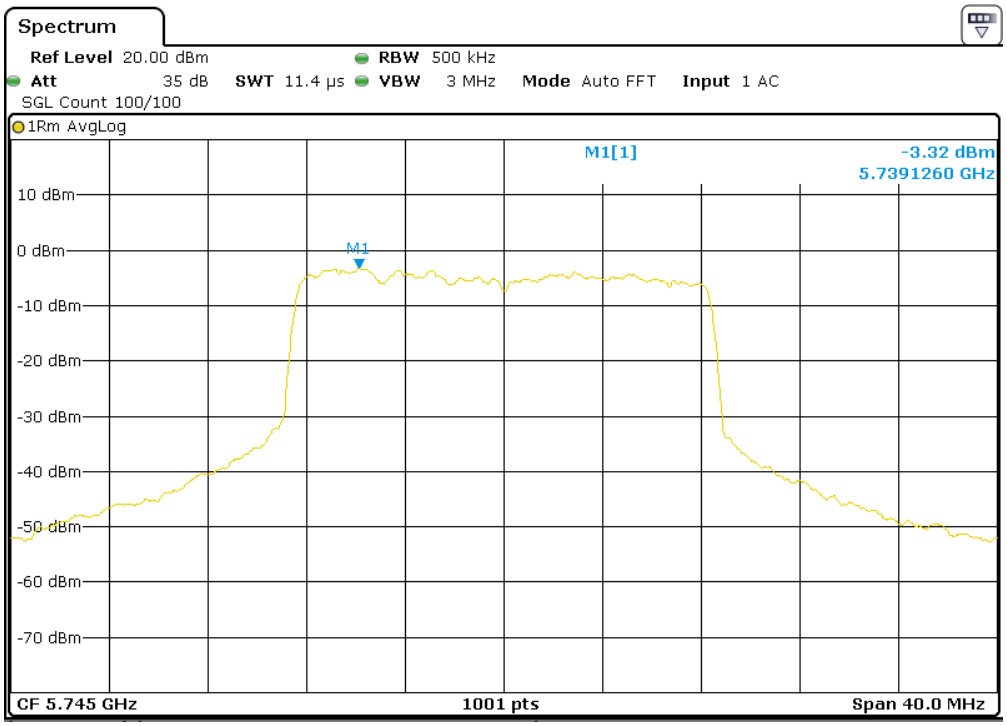
1) Peak Power Spectral Density = Reading + Cable loss+ Duty Cycle Correction Factor

2) Cable loss= 0.5dB. Duty cycle of test signal is > 98%, duty factor is not required, reference Section 7.4

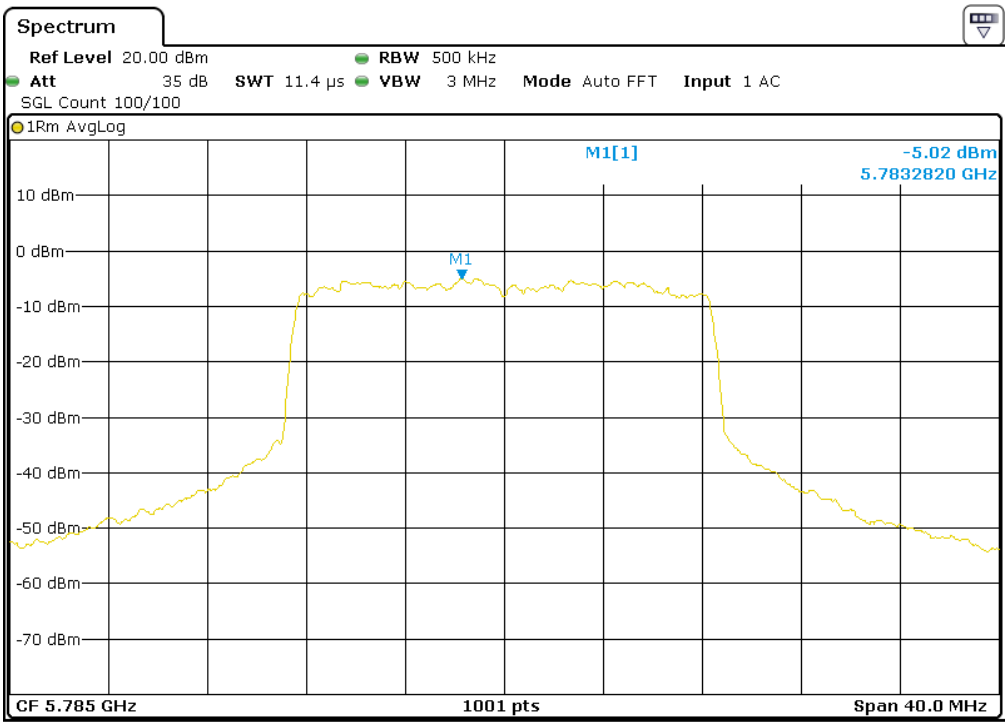
3) Per KDB 662911, the conducted powers at Antenna A and Antenna B were first measured separately during MIMO transmission as shown in section above. The measured values were then summed in linear power units then converted back to dBm.

Test plot as below:

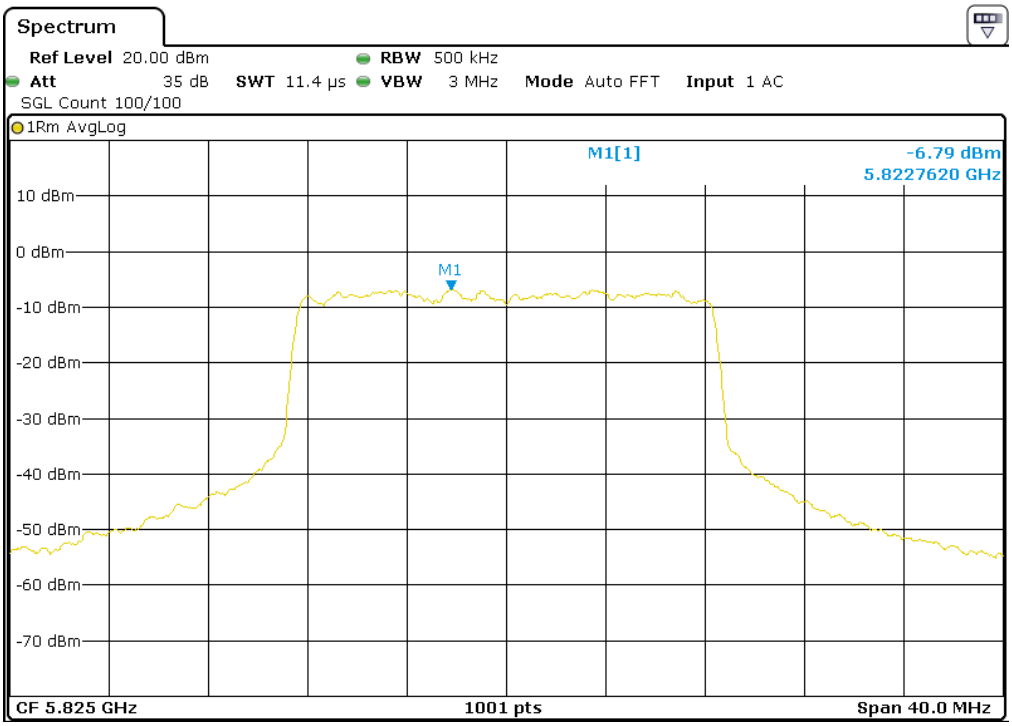
802.11 a	Antenna A	Channel 149



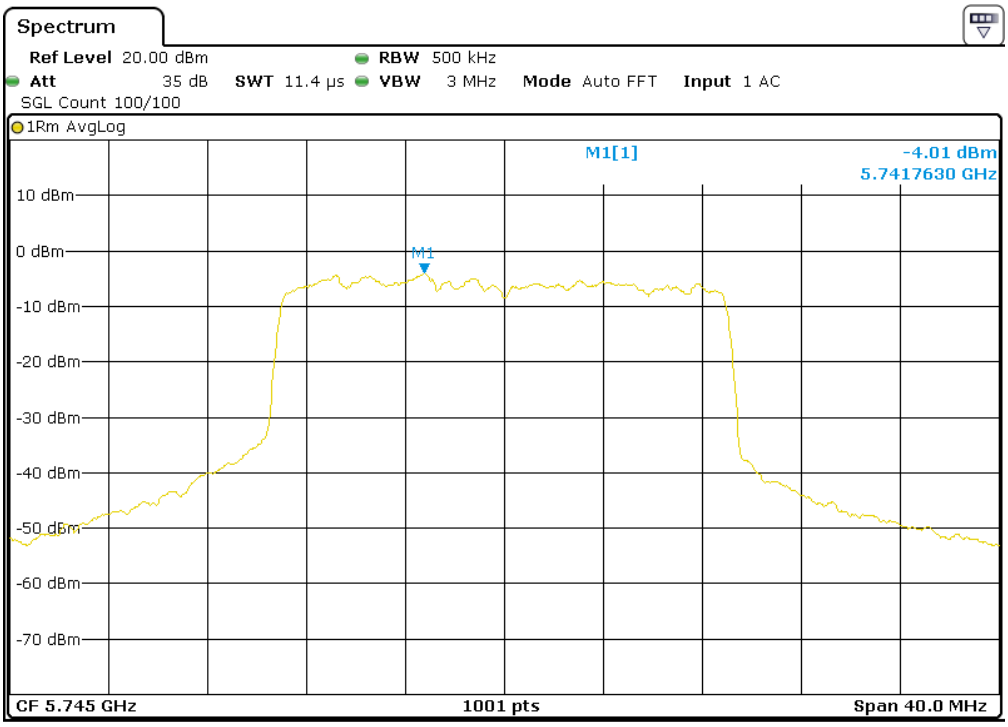
802.11 a	Antenna A	Channel 157



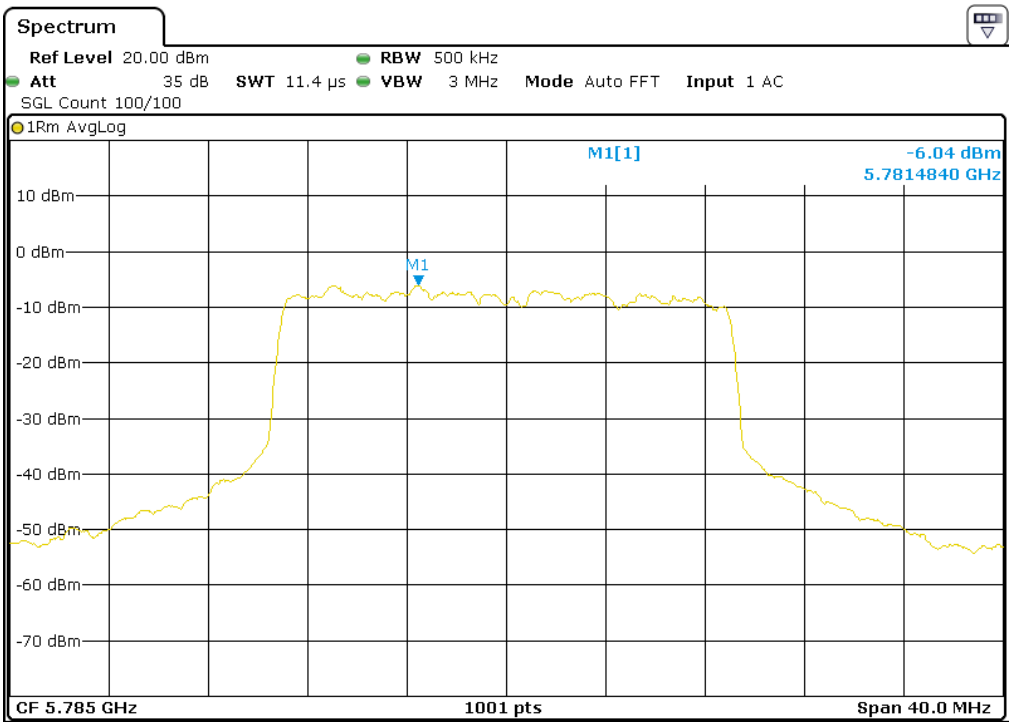
802.11 a	Antenna A	Channel 165



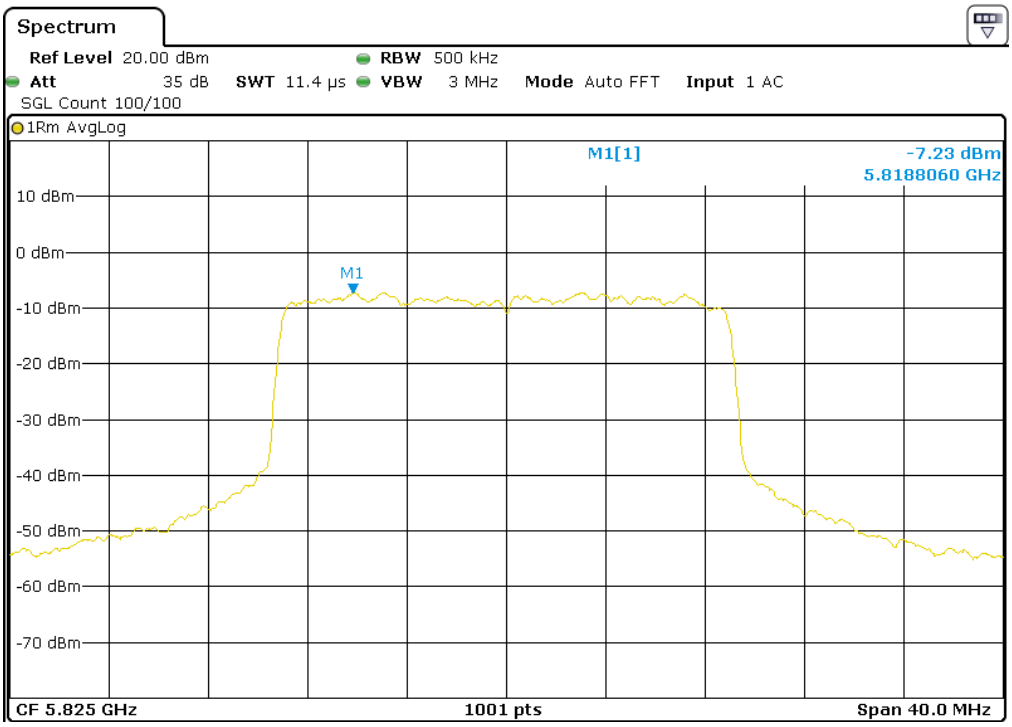
802.11 n(HT20)	Antenna A	Channel 149



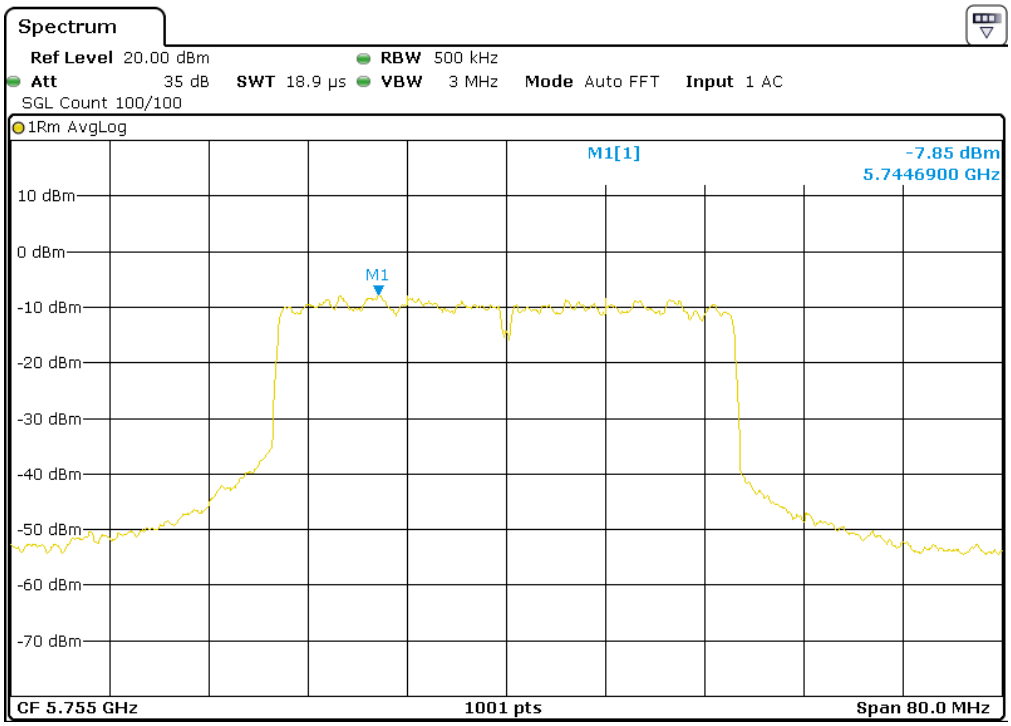
802.11 n(HT20)	Antenna A	Channel 157



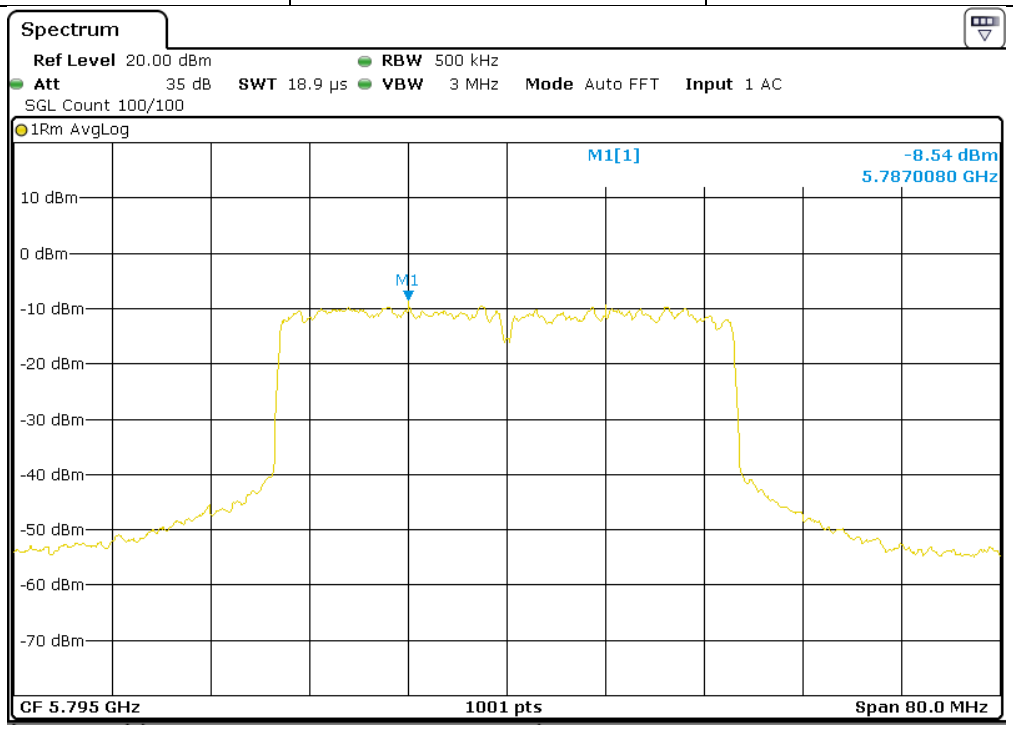
802.11 n(HT20)	Antenna A	Channel 165



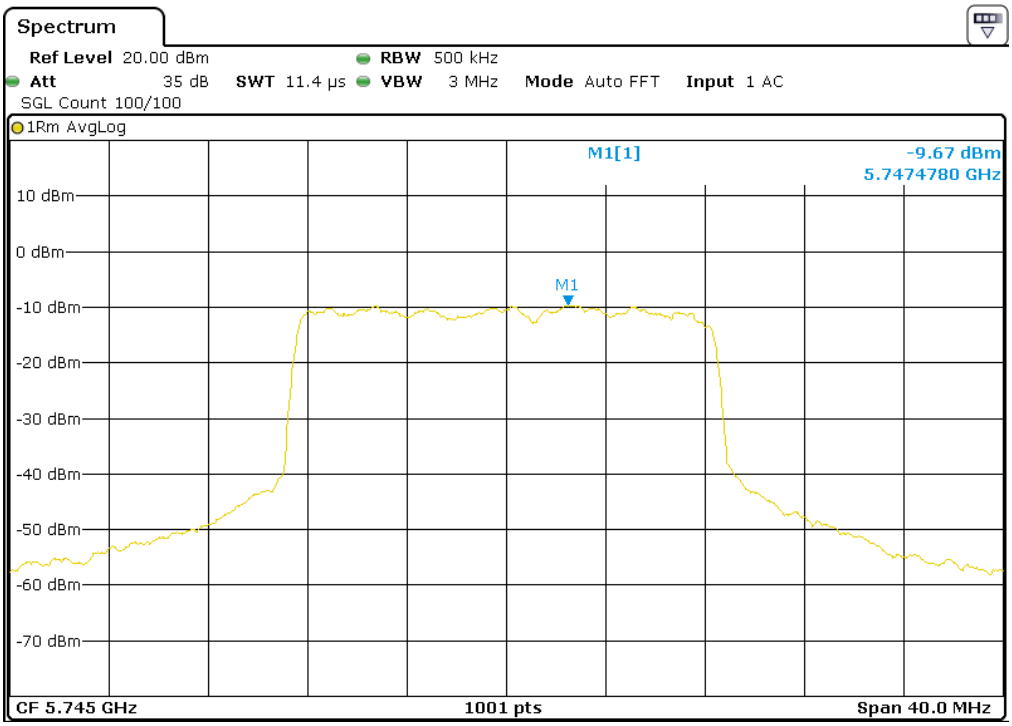
802.11 n(HT40)	Antenna A	Channel 151



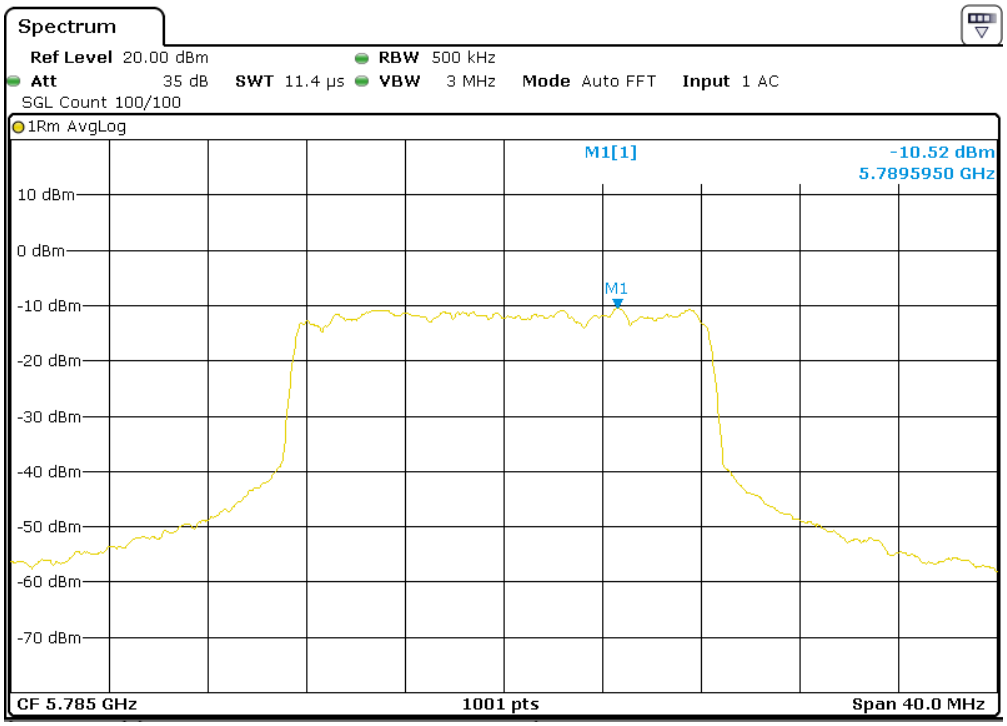
802.11 n(HT40)	Antenna A	Channel 159



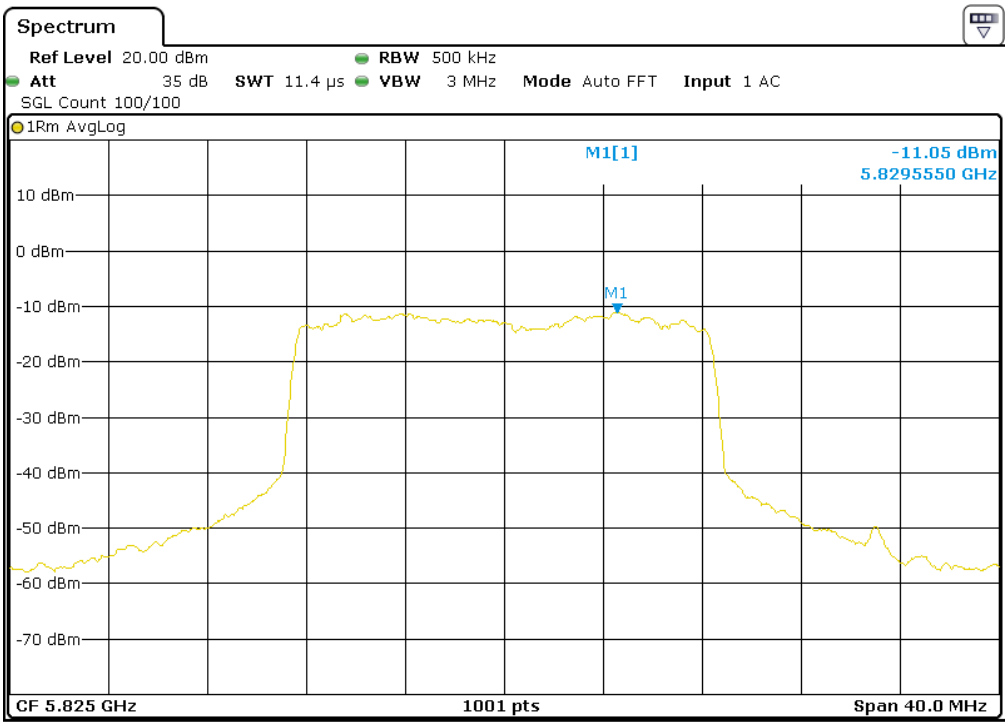
802.11 a	Antenna B	Channel 149



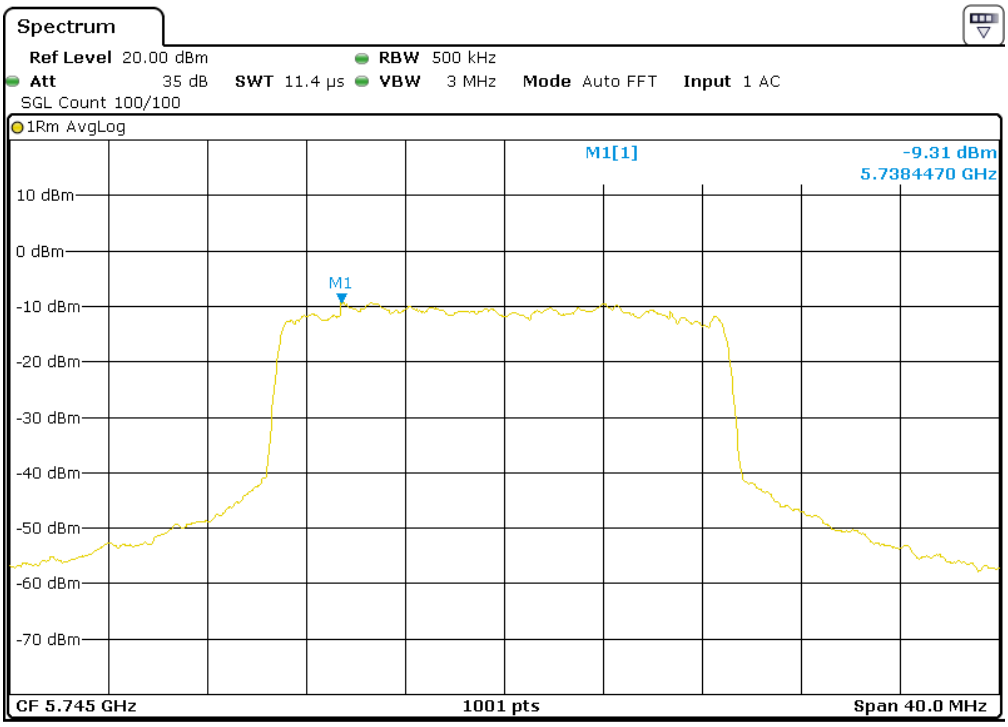
802.11 a	Antenna B	Channel 157



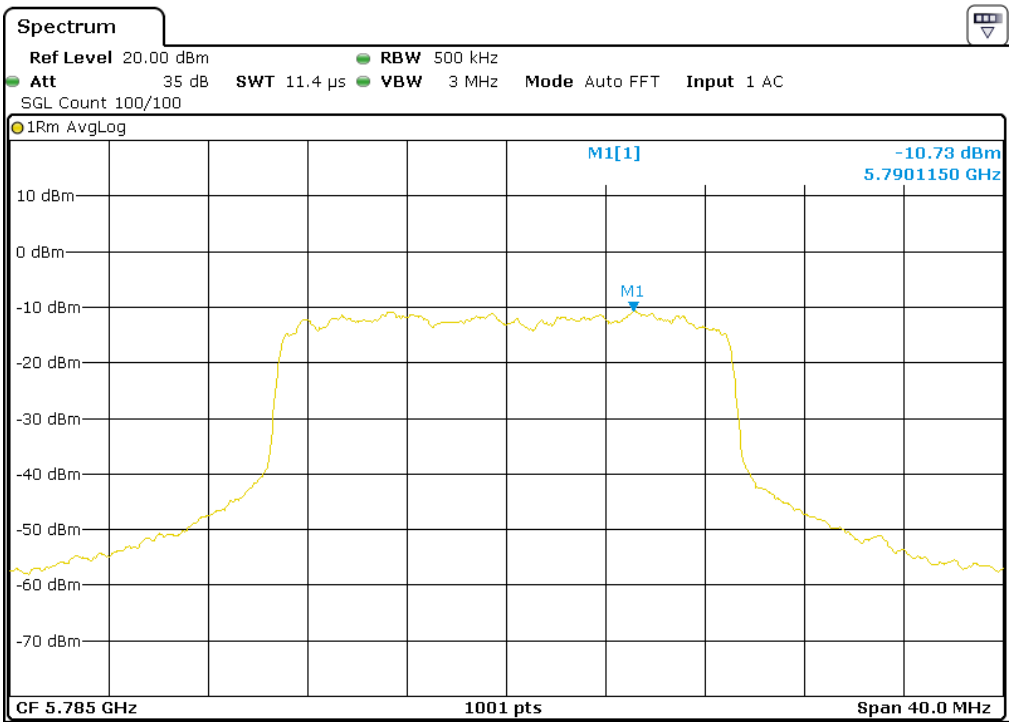
802.11 a	Antenna B	Channel 165



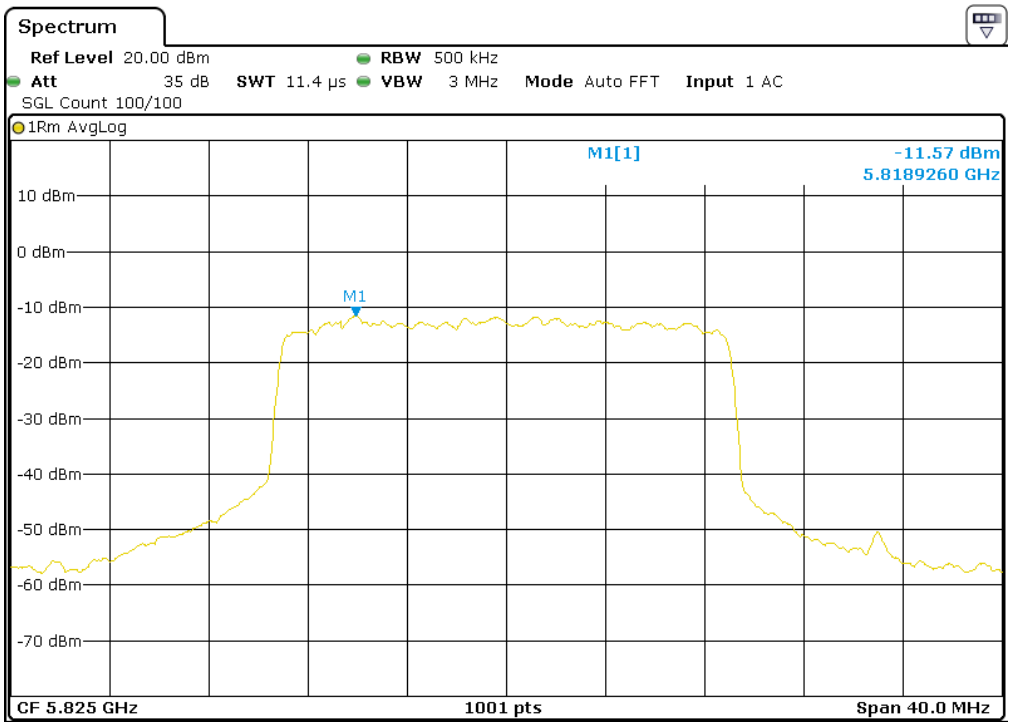
802.11 n(HT20)	Antenna B	Channel 149



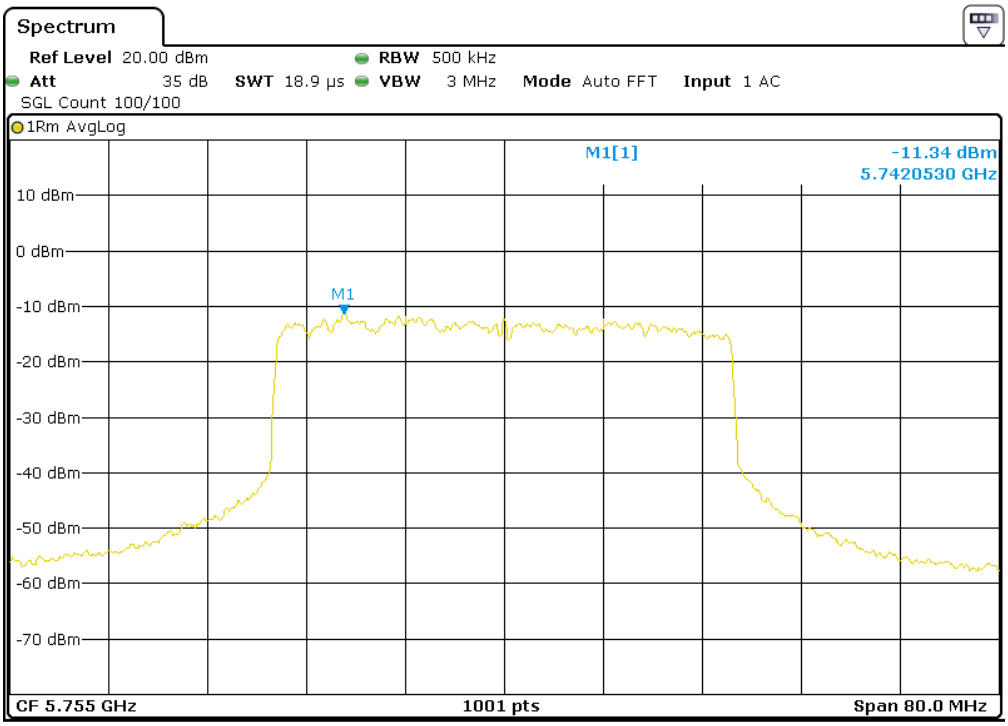
802.11 n(HT20)	Antenna B	Channel 157



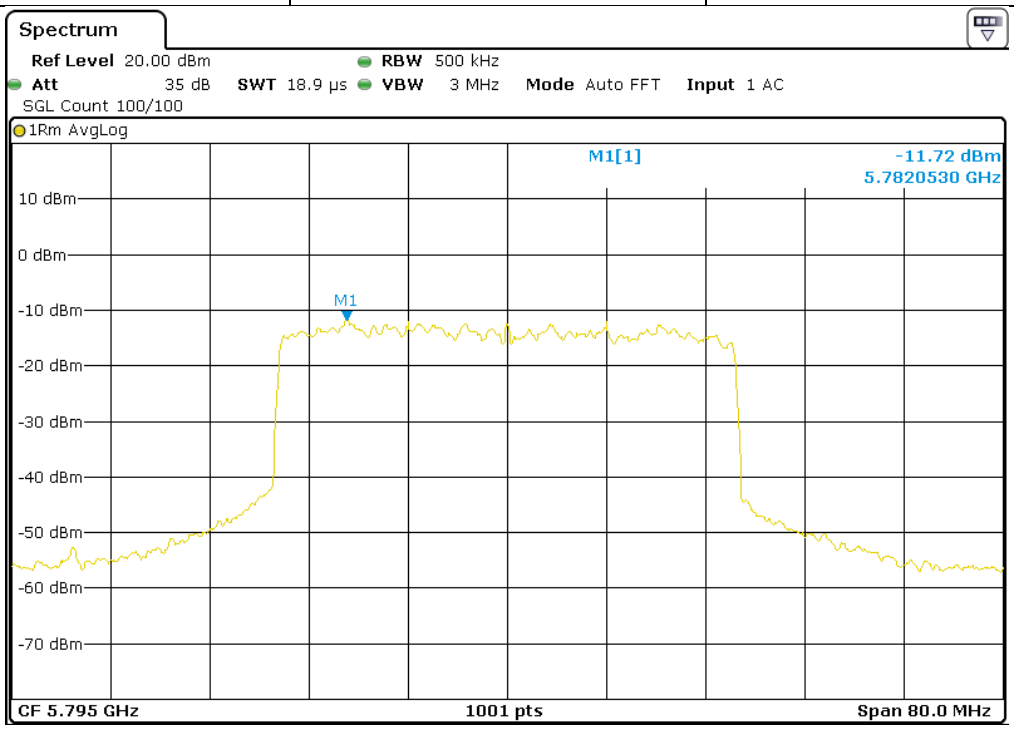
802.11 n(HT20)	Antenna B	Channel 165



802.11 n(HT40)	Antenna B	Channel 151



802.11 n(HT40)	Antenna B	Channel 159



7.9 Radiated Spurious Emissions and Band-edge

Test site/setup: Measurement Distance: 3m (Semi-Anechoic Chamber)

Test instrumentation set-up:

Frequency Range(MHz)	Detector	RBW	VBW
0.009-0.090	Peak	10kHz	30kHz
0.009-0.090	Average	10kHz	30kHz
0.090-0.110	Quasi-peak	10kHz	30kHz
0.110-0.490MHz	Peak	10kHz	30kHz
0.110-0.490	Average	10kHz	30kHz
0.490 -30	Quasi-peak	10kHz	30kHz
30-1000	Quasi-peak	100kHz	300kHz
Above 1000	Peak	RBW=1MHz	VBW≥RBW
	Average		VBW=10Hz

Sweep=Auto

15.209 Limit:

Frequency(MHz)	Limit (dBuV/m)
0.009-0.490	128.5 ~ 93.8
0.490-1.705	73.8 ~63.0
1.705-30	69.5
30-88	40.0
88-216	43.5
216-960	46.0
960-1000	54.0
Above 1000	54.0

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

15.407 Limit:

Operation Frequency (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength (dBμV/m)
5150-5250	-27	68.3
5250-5350		
5470-5725		
5725-5850	-27*[1]	68.3*[1]
	-17*[2]	78.3*[2]

Note: The following formula is used to convert the EIRP to field strength

$E=\frac{1000000\sqrt{30P}}{3}$ uV/m, where P is the EIRP (Watts).

Remark: *[1] Without 10MHz of band edge; *[2] Within 10MHz of band edge

Test Setup:

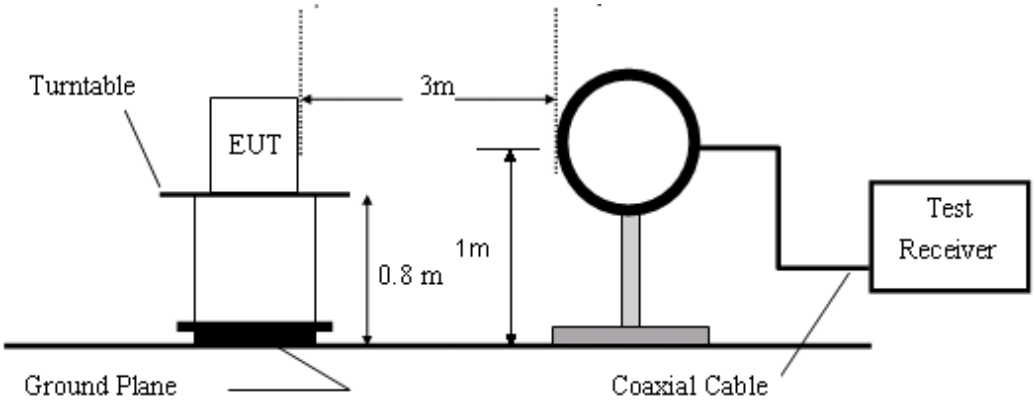


Figure1. Below 30MHz radiated emissions test configuration

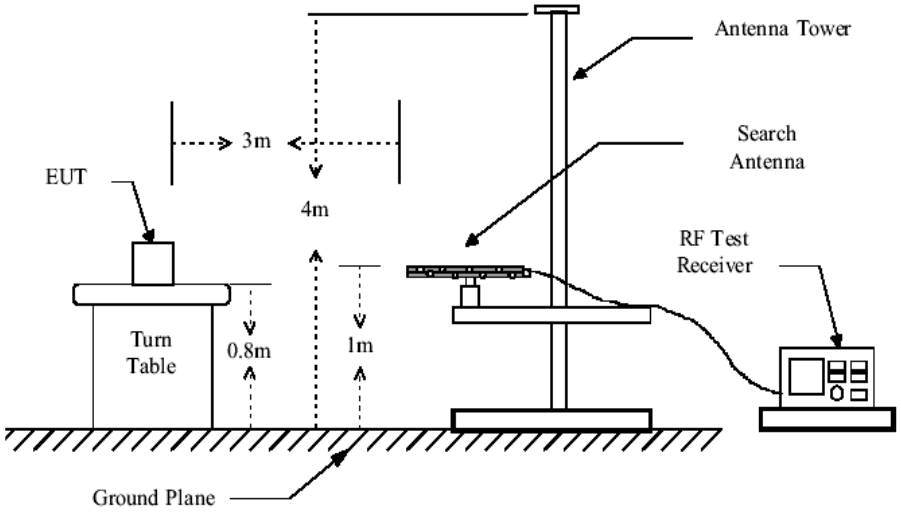


Figure2. 30MHz to 1GHz radiated emissions test configuration

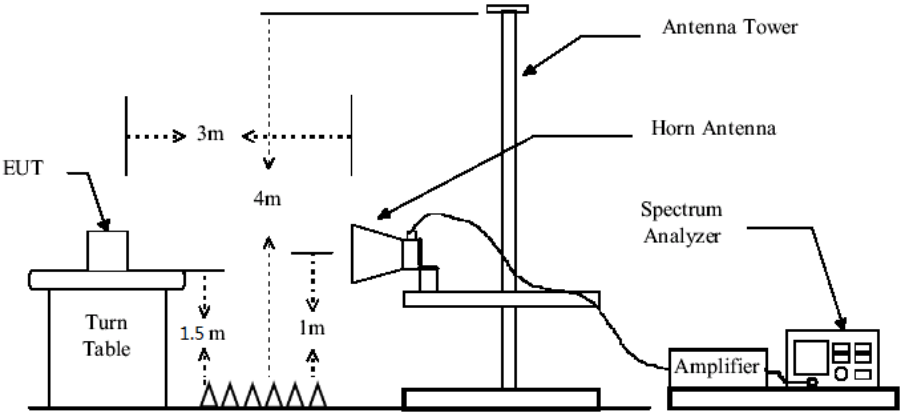


Figure3. Above 1GHz radiated emissions test configuration

Test Procedure:

1) The procedure used was ANSI Standard C63.10. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.
2) Low noise amplifier was used below 1GHz, High pass Filter and amplifier was used above 3GHz. We did not use any amplifier or filter between 1G and 3GHz.
3) Test were performed for their spatial orthogonal(X, Y, Z), the worst test data (X orthogonal) was submitted.
   a) For this intentional radiator operates below 25 GHz. the spectrum shall be investigated to the tenth harmonic of the highest fundamental frequency. And above the third harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 5rd harmonic.
   b) As shown in Section, for frequencies above 1000MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.
4) Radiated spurious emissions were investigated while operating in SISO mode, however, it was determined that single antenna operation produced the worst emissions. Since the emissions produced from SISO operation were found to be more than 20 dB below the limit, the SISO emissions are not report.
5) Pretest under all modes during 30MHz to 1GHz; choose the worst case mode (Middle channel of 802.11a on band 3) record on the report.
6) No spurious emissions were detected within 20dB of limit below 30MHz.

Test Result: Pass

7.9.1 Radiated Spurious Emissions

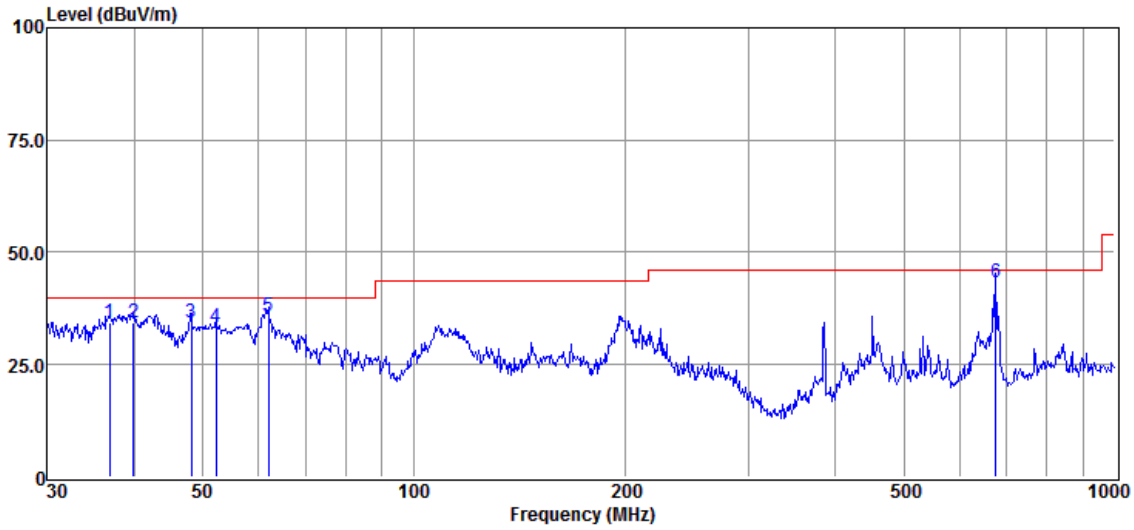
30MHz-1GHz:

802.11 a **Channel: 149**

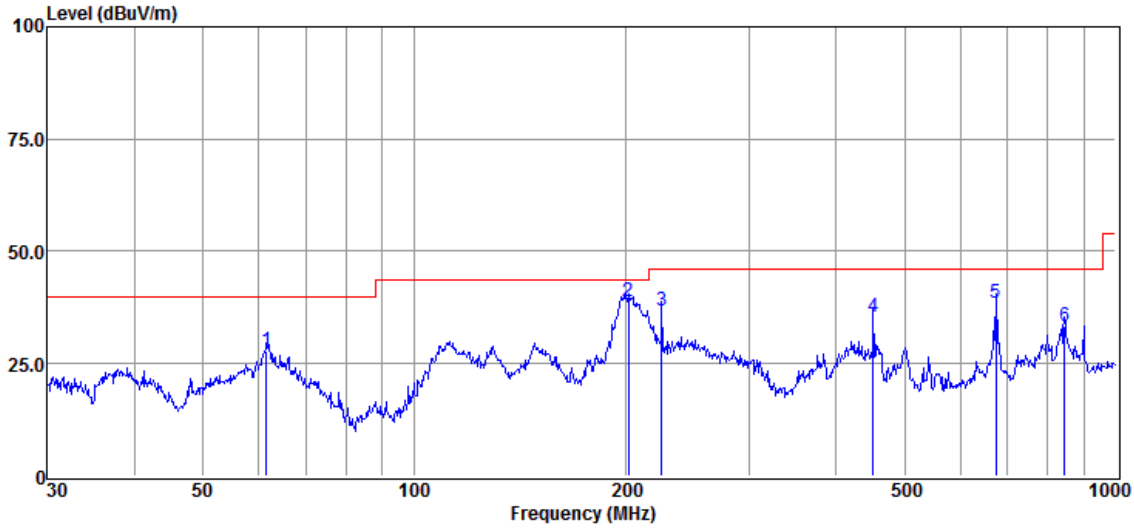
Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector	Polarization
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		
1	61.56	58.35	12.29	43.72	0.80	27.72	40.00	-12.28	QP	Horizontal
2	202.10	69.85	10.67	43.41	1.61	38.72	43.50	-4.78	QP	Horizontal
3	225.31	68.33	10.05	43.38	1.75	36.75	46.00	-9.25	QP	Horizontal
4	451.14	59.33	16.68	43.20	2.58	35.39	46.00	-10.61	QP	Horizontal
5	675.21	58.57	19.81	43.10	3.28	38.56	46.00	-7.44	QP	Horizontal
6	845.09	49.11	23.60	43.04	3.74	33.41	46.00	-12.59	QP	Horizontal
1	36.84	64.54	12.95	43.85	0.58	34.22	40.00	-5.78	QP	Vertical
2	39.78	64.09	13.48	43.83	0.60	34.34	40.00	-5.66	QP	Vertical
3	48.17	63.73	13.89	43.78	0.68	34.52	40.00	-5.48	QP	Vertical
4	52.19	62.99	13.54	43.76	0.72	33.49	40.00	-6.51	QP	Vertical
5	62.12	66.33	12.35	43.71	0.80	35.77	40.00	-4.23	QP	Vertical
6	677.01	63.51	19.77	43.10	3.29	43.47	46.00	-2.53	QP	Vertical

Remark: 1. Result Level = Read Level + Antenna Factor + Cable loss - Preamp Factor

Below is the plot of worst case:
Vertical:



Horizontal:



Above 1GHz

802.11a **Channel: 149**

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	7180	38.14	10.52	48.66	54	-5.34	peak	Horizontal
2	8656	38.44	12.63	51.07	54	-2.93	peak	Horizontal
3	11490	36.82	14.41	51.23	54	-2.77	peak	Horizontal
4	8380	38.78	11.93	50.71	54	-3.29	peak	Vertical
5	9172	36.64	14.03	50.67	54	-3.33	peak	Vertical
6	11490	37.09	14.41	51.5	54	-2.5	peak	Vertical

802.11a **Channel: 157**

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	8656	38.44	12.63	51.07	54	-2.93	peak	Horizontal
2	9112	36.97	13.93	50.9	54	-3.1	peak	Horizontal
3	11570	39.35	14.25	53.6	54	-0.4	peak	Horizontal
4	9280	37.32	14.21	51.53	54	-2.47	peak	Vertical
5	10288	37.09	14.38	51.47	54	-2.53	peak	Vertical
6	11570	38.16	14.25	52.41	54	-1.59	peak	Vertical

802.11a **Channel: 165**

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	8656	38.44	12.63	51.07	54	-2.93	peak	Horizontal
2	9256	37.18	14.17	51.35	54	-2.65	peak	Horizontal
3	11650	38.42	14.06	52.48	54	-1.52	peak	Horizontal
4	7192	39.22	10.56	49.78	54	-4.22	peak	Vertical
5	8800	38.55	13.07	51.62	54	-2.38	peak	Vertical
6	11650	40.19	14.06	54.25	54	0.25	peak	Vertical

802.11 n(HT20) **Channel: 149**

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	8944	37.55	13.55	51.1	54	-2.9	peak	Horizontal
2	10420	37.06	14.17	51.23	54	-2.77	peak	Horizontal
3	11490	37.29	14.41	51.7	54	-2.3	peak	Horizontal
4	8932	36	13.52	49.52	54	-4.48	peak	Vertical
5	9892	37.46	14.39	51.85	54	-2.15	peak	Vertical
6	11490	36.87	14.41	51.28	54	-2.72	peak	Vertical

802.11 n(HT20) **Channel: 157**

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	8428	38.85	12.03	50.88	54	-3.12	peak	Horizontal
2	9040	36.82	13.81	50.63	54	-3.37	peak	Horizontal
3	11570	37.52	14.25	51.77	54	-2.23	peak	Horizontal
4	9100	35.35	13.91	49.26	54	-4.74	peak	Vertical
5	10372	35.96	14.26	50.22	54	-3.78	peak	Vertical
6	11570	35.77	14.25	50.02	54	-3.98	peak	Vertical

802.11 n(HT20) **Channel: 165**

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	9040	36.82	13.81	50.63	54	-3.37	peak	Horizontal
2	9976	37.02	14.42	51.44	54	-2.56	peak	Horizontal
3	11650	37.36	14.06	51.42	54	-2.58	peak	Horizontal
4	8236	38.41	11.65	50.06	54	-3.94	peak	Vertical
5	8932	36	13.52	49.52	54	-4.48	peak	Vertical
6	11650	36.87	14.06	50.93	54	-3.07	peak	Vertical

802.11 n(HT40) **Channel: 151**

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	8284	39.92	11.74	51.66	54	-2.34	peak	Horizontal
2	8932	37.29	13.52	50.81	54	-3.19	peak	Horizontal
3	11510	38.09	14.4	52.49	54	-1.51	peak	Horizontal
4	7512	38.78	11.92	50.7	54	-3.3	peak	Vertical
5	8755	36.87	12.94	49.81	54	-4.19	peak	Vertical
6	11510	35.19	14.4	49.59	54	-4.41	peak	Vertical

802.11 n(HT40) **Channel: 159**

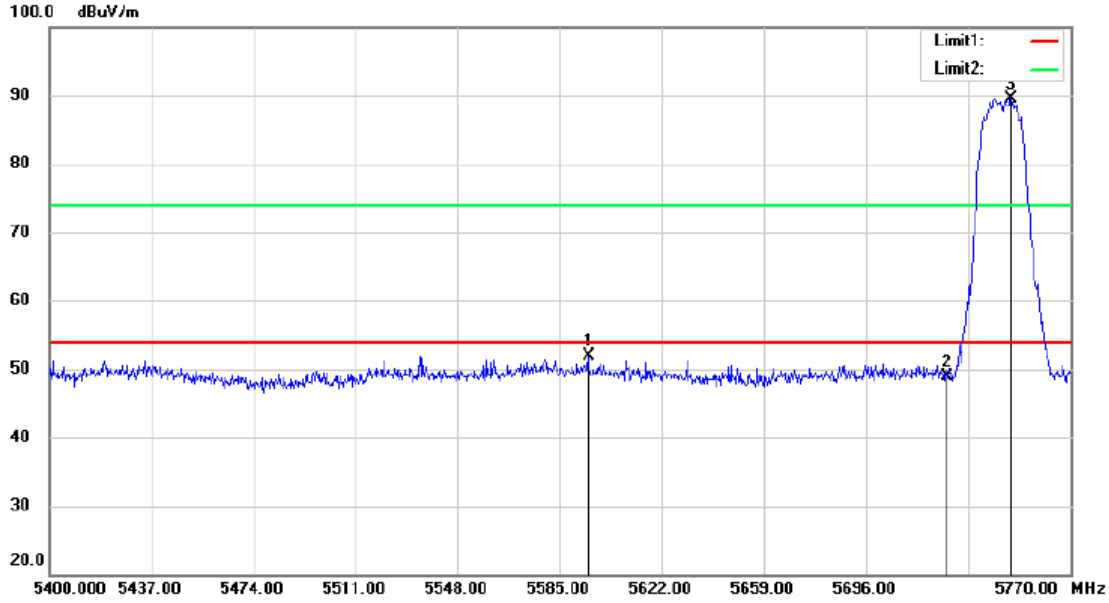
Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	8536	39.11	12.27	51.38	54	-2.62	peak	Horizontal
2	10384	38.36	14.23	52.59	54	-1.41	peak	Horizontal
3	11590	38.12	14.2	52.32	54	-1.68	peak	Horizontal
4	8755	36.87	12.94	49.81	54	-4.19	peak	Vertical
5	10152	36.75	14.4	51.15	54	-2.85	peak	Vertical
6	11590	36.31	14.2	50.51	54	-3.49	peak	Vertical

7.9.2 Radiated Band-edge

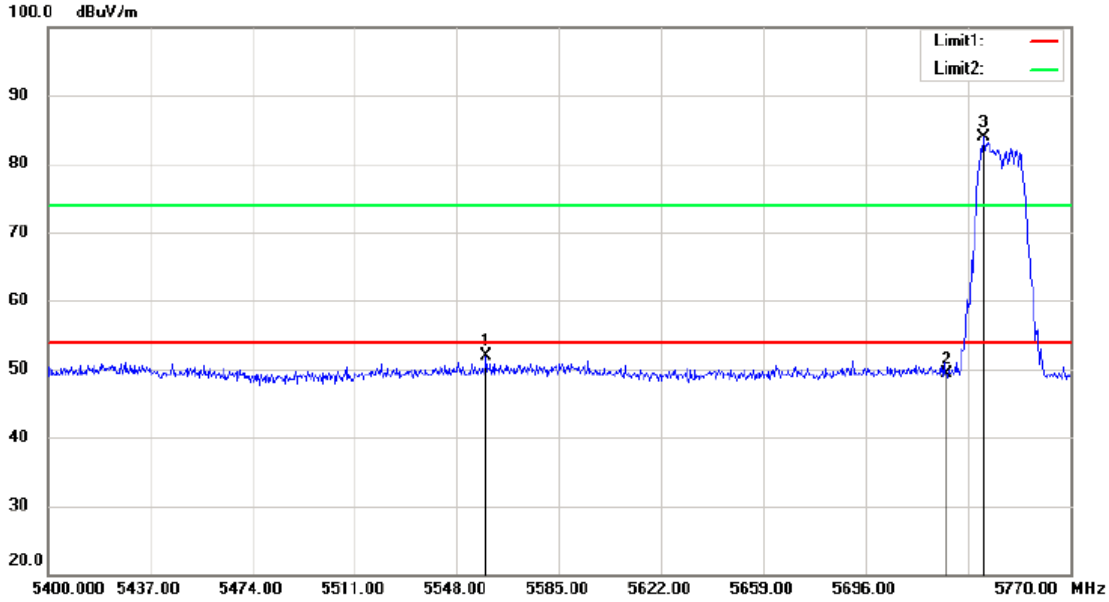
802.11 a **Channel: 149**

MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	5595.36	45.2	6.78	51.98	54	-2.02	Peak	Horizontal
2	5725	42.1	6.82	48.92	54	-5.08	Peak	Horizontal
3	5748.54	82.79	6.77	89.56	54	35.56	Peak	Horizontal
1	5558.73	45.15	6.84	51.99	54	-2.01	Peak	Vertical
2	5725	42.56	6.82	49.38	54	-4.62	Peak	Vertical
3	5738.55	77.14	6.8	83.94	54	29.94	Peak	Vertical

Horizontal



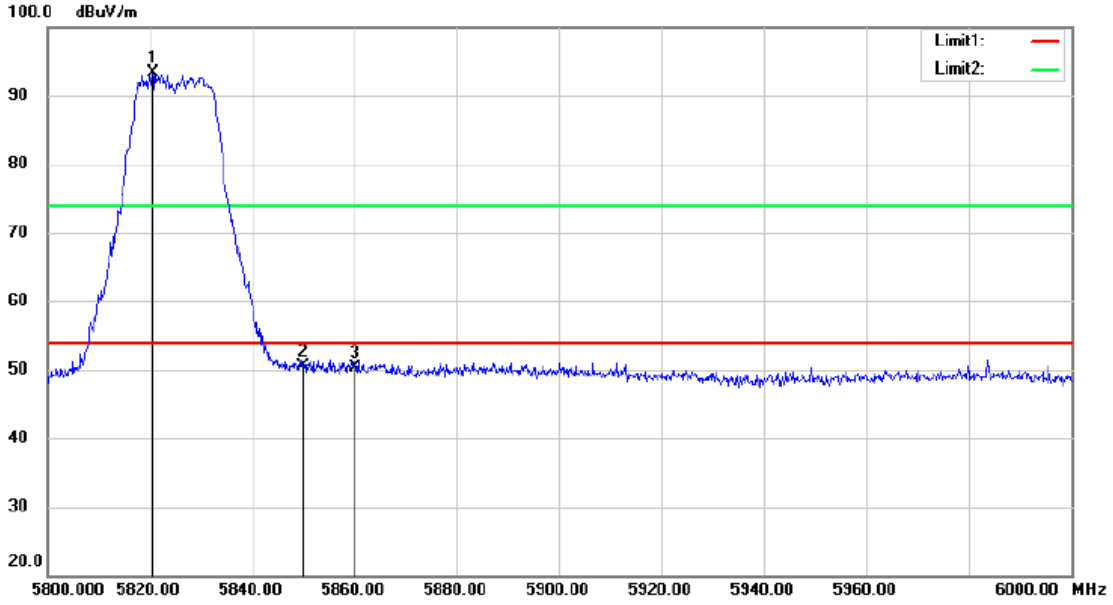
Vertical



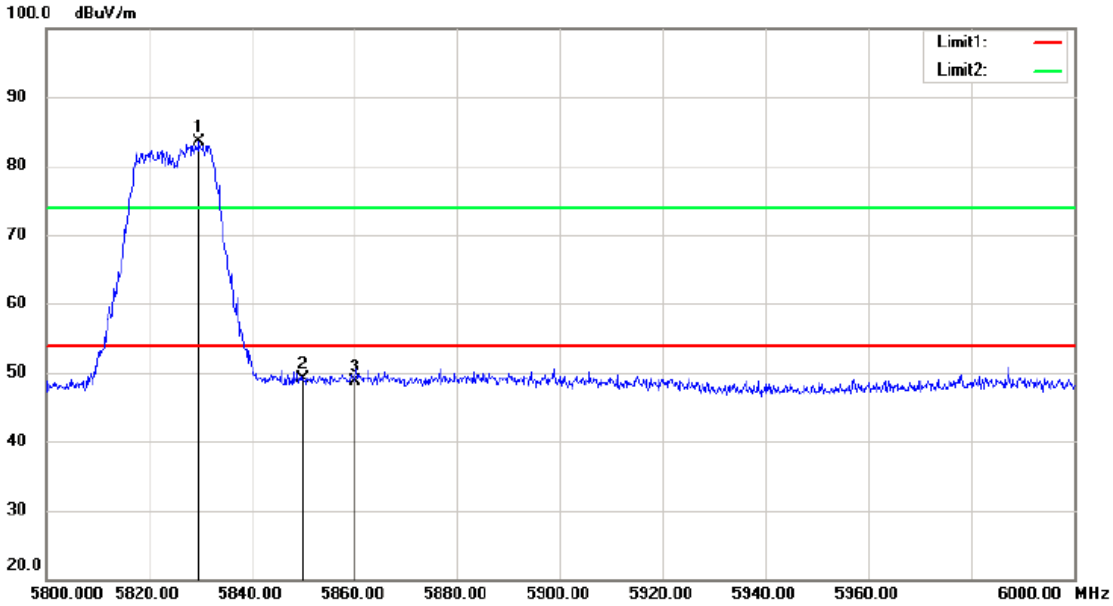
802.11 a **Channel: 165**

MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	5820.6	86.65	6.65	93.3	54	39.3	Peak	Horizontal
2	5850	43.86	6.64	50.5	54	-3.5	Peak	Horizontal
3	5860	43.77	6.63	50.4	54	-3.6	Peak	Horizontal
1	5829.8	76.8	6.66	83.46	54	29.46	Peak	Vertical
2	5850	42.52	6.64	49.16	54	-4.84	Peak	Vertical
3	5860	42.16	6.63	48.79	54	-5.21	Peak	Vertical

Horizontal



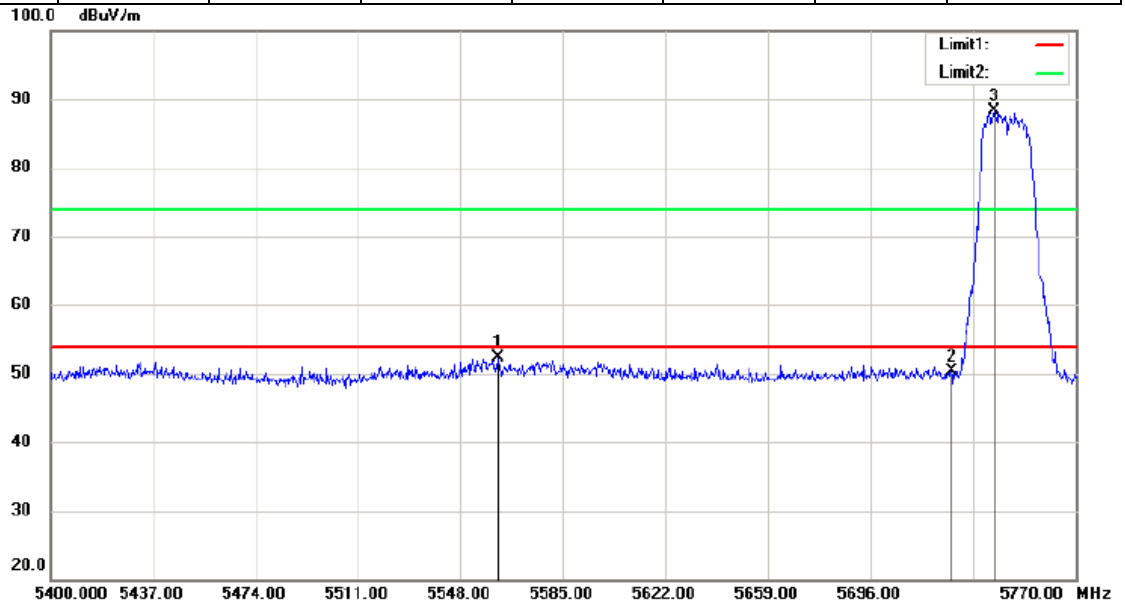
Vertical



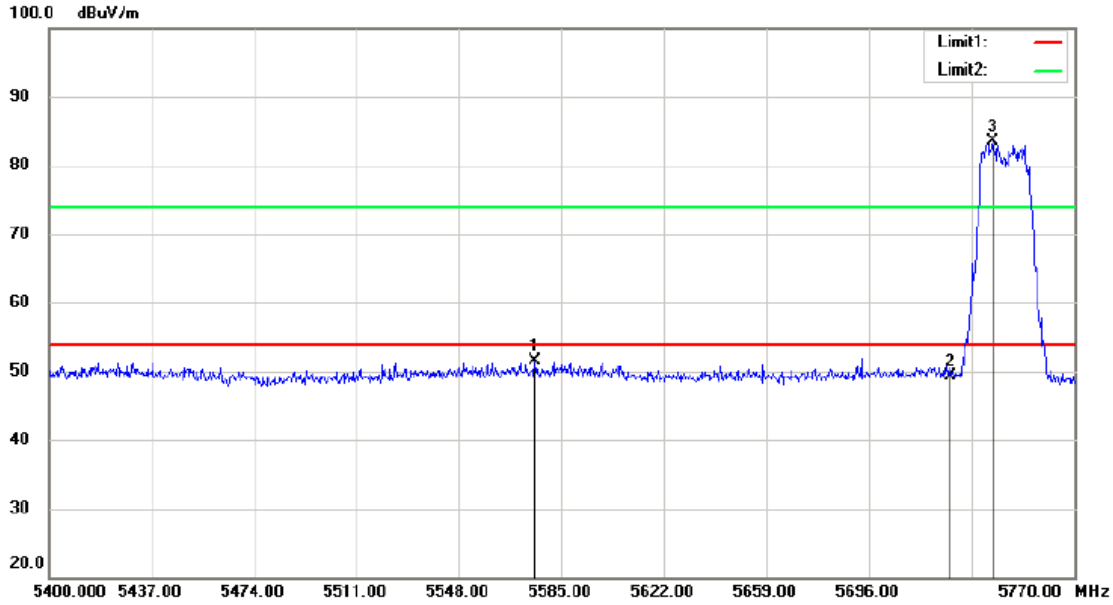
802.11 n(HT20) **Channel: 149**

MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	5561.32	45.52	6.84	52.36	54	-1.64	Peak	Horizontal
2	5725	43.47	6.82	50.29	54	-3.71	Peak	Horizontal
3	5740.77	81.43	6.79	88.22	54	34.22	Peak	Horizontal
1	5575.38	44.75	6.81	51.56	54	-2.44	Peak	Vertical
2	5725	42.53	6.82	49.35	54	-4.65	Peak	Vertical
3	5740.77	76.68	6.79	83.47	54	29.47	Peak	Vertical

Horizontal



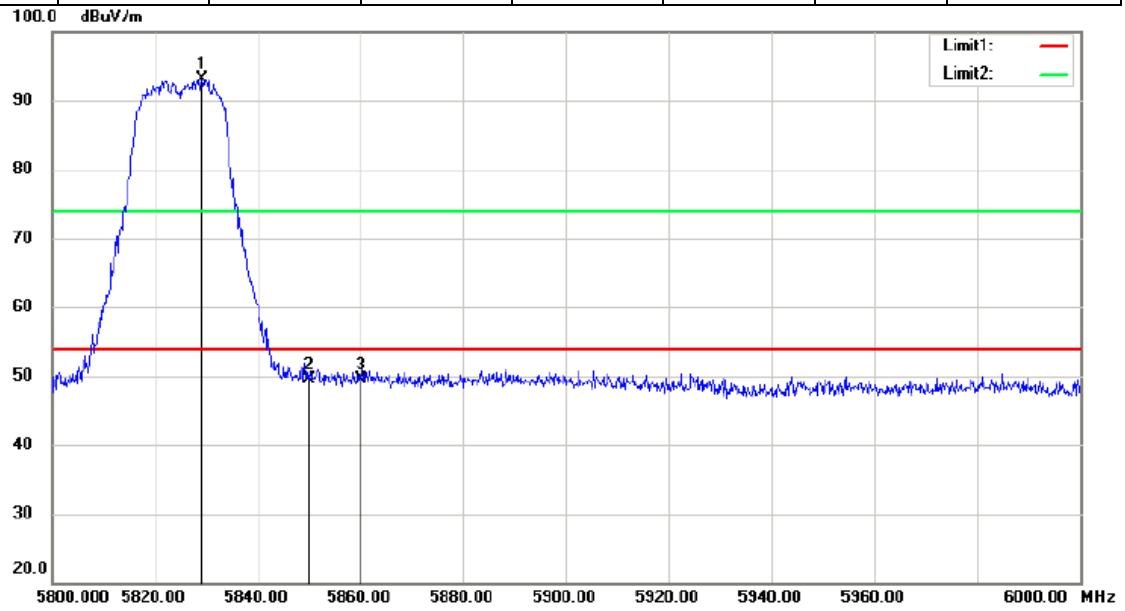
Vertical



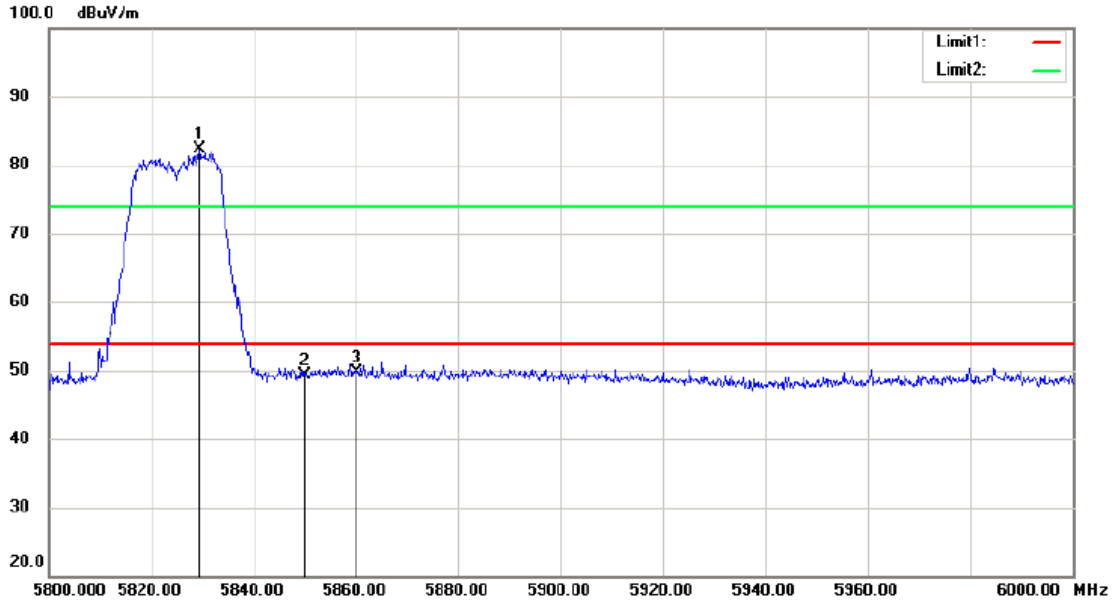
802.11 n(HT20) **Channel: 165**

MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	5829.2	86.48	6.66	93.14	54	39.14	Peak	Horizontal
2	5850	42.9	6.64	49.54	54	-4.46	Peak	Horizontal
3	5860	42.95	6.63	49.58	54	-4.42	Peak	Horizontal
1	5829.4	75.64	6.66	82.3	54	28.3	Peak	Vertical
2	5850	42.59	6.64	49.23	54	-4.77	Peak	Vertical
3	5860	43.17	6.63	49.8	54	-4.2	Peak	Vertical

Horizontal



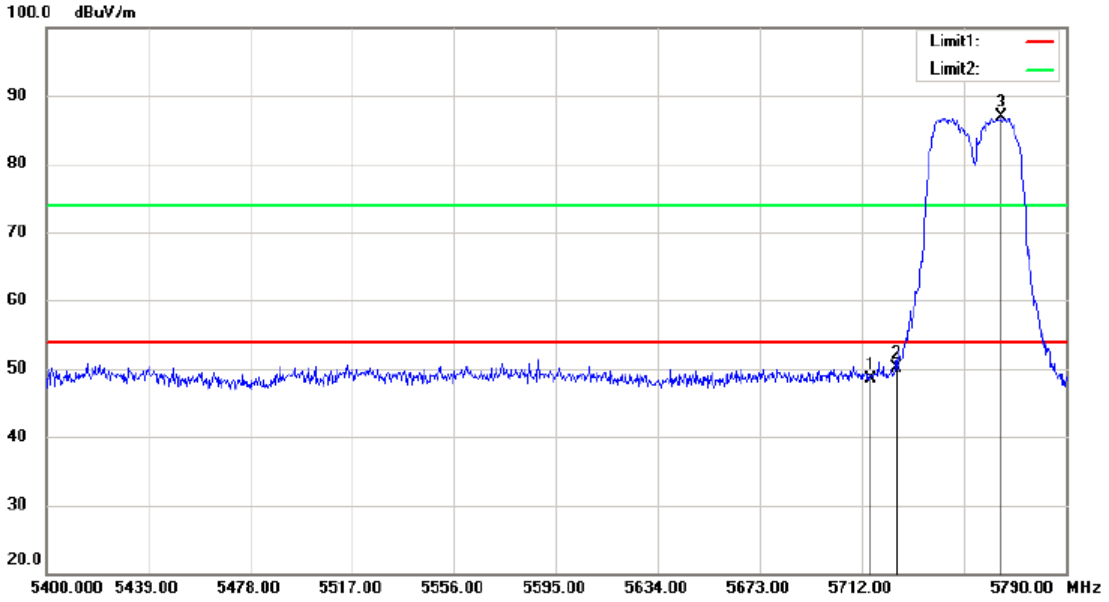
Vertical



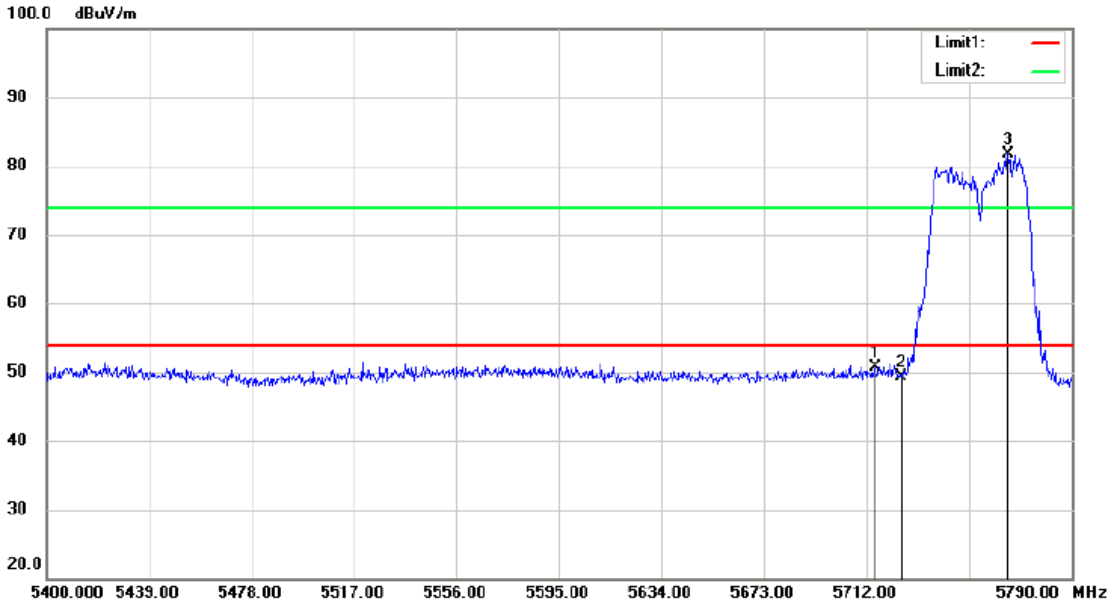
802.11 n(HT40) **Channel: 151**

MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	5715	41.65	6.84	48.49	54	-5.51	Peak	Horizontal
2	5725	43.26	6.82	50.08	54	-3.92	Peak	Horizontal
3	5765.04	80.09	6.75	86.84	54	32.84	Peak	Horizontal
1	5715	43.85	6.84	50.69	54	-3.31	Peak	Vertical
2	5725	42.39	6.82	49.21	54	-4.79	Peak	Vertical
3	5765.82	74.92	6.74	81.66	54	27.66	Peak	Vertical

Horizontal



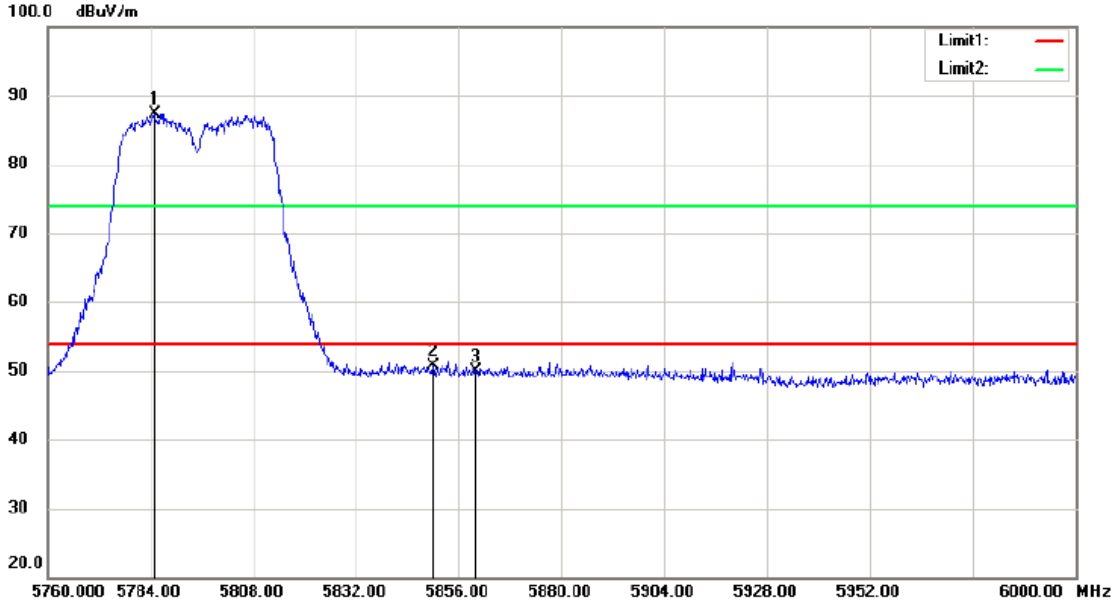
Vertical



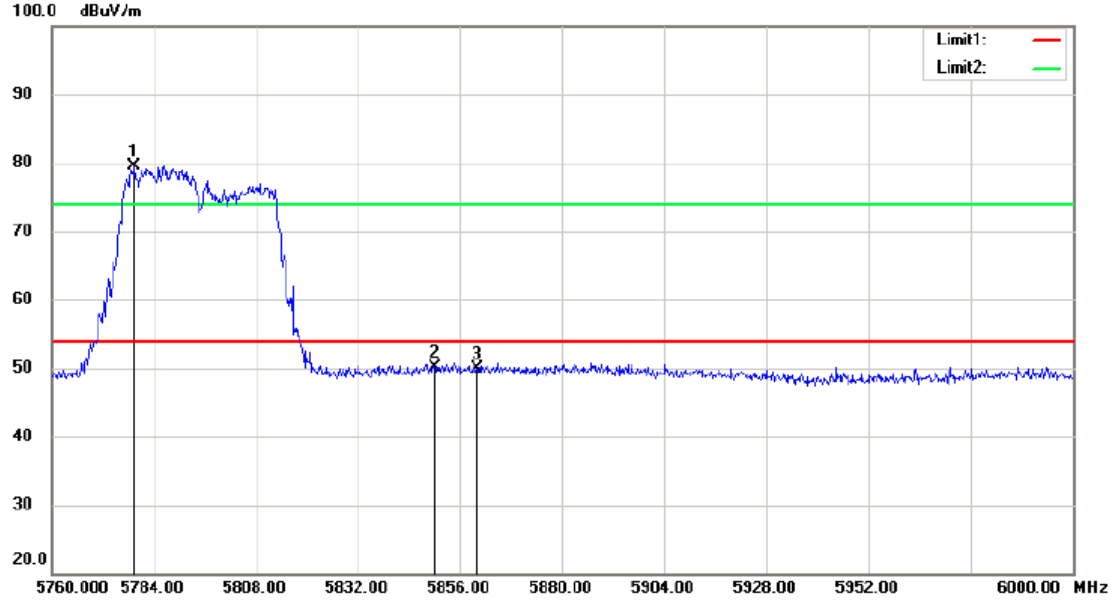
802.11 n(HT40) **Channel: 159**

MK.	Frequency (MHz)	Reading (dBuV/m)	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	5785.2	80.67	6.7	87.37	54	33.37	Peak	Horizontal
2	5850	44.03	6.64	50.67	54	-3.33	Peak	Horizontal
3	5860	43.25	6.63	49.88	54	-4.12	Peak	Horizontal
1	5779.44	72.7	6.72	79.42	54	25.42	Peak	Vertical
2	5850	43.54	6.64	50.18	54	-3.82	Peak	Vertical
3	5860	43.31	6.63	49.94	54	-4.06	Peak	Vertical

Horizontal



Vertical



Remark: 1. Test Level = Receiver Reading + Antenna Factor + Cable Loss- Preamplifier Factor

2. No any other emission which falls in restricted bands can be detected and be reported.

3. If the Peak value below the AV Limit, the AV test doesn't perform for this submission.

All frequencies within the "Restricted bands" have been evaluated to compliance. Section 15.205 Restricted bands of operation.

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.5 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	
13.36 - 13.41			

7.10 Transmission in the Absence of Data

7.10.1 Standard Applicable

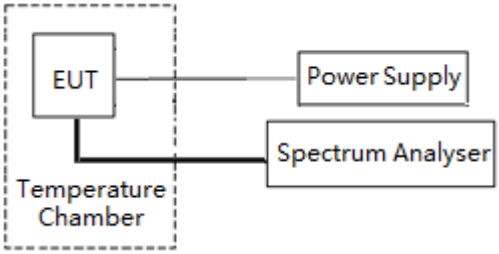
The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

7.10.2 Test Result

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

7.11 Frequency stability

Test setup:



Test Procedure:

a) The EUT was place in the temperature chamber, the DC leads and RF output cable exited the chamber though an opening made for that purpose.

b) After operate the equipment in standby conditions for 15 minutes before proceeding. The temperature was varied from -20℃ to +55℃ at intervals of not more than 10℃. The frequency stability was read from the spectrum analyzer and the frequency stability and input voltage was record.

Test Limit: The frequency of carrier signal shall be maintained within the band of operation

Test Data:

Test Conditions		Operation Frequency(MHz)	Test Frequency (MHz)	Freq. Dev. (Hz)	Limit (GHz)	Result
Volt (V AC)	Temp (℃)					
Normal(120)	Extreme(-20)	5825	5824.9741	0.0259	5.725-5.85	Pass
	Extreme(-10)		5824.9752	0.0248		Pass
	Extreme(0)		5824.9772	0.0228		Pass
	Extreme(+10)		5824.9761	0.0239		Pass
	Extreme(+20)		5824.9778	0.0222		Pass
	Extreme(+30)		5824.9721	0.0279		Pass
	Extreme(+40)		5824.9756	0.0244		Pass
	Extreme(+55)		5824.9735	0.0265		Pass
Extreme(102)	Norma(20)		5824.9778	0.0222		Pass
Extreme(138)			5824.9973	0.0027		Pass

Remark: Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

8 Test Setup Photographs

Refer to the < DH-PFM881_Test Setup photos-FCC>.

9 EUT Constructional Details

Refer to the < DH-PFM881 _External Photos > & < DH-PFM881 _Internal Photos >.

--End of the Report--