

Prüfbericht-Nr.: <i>Test Report No.:</i>	50278819 001	Auftrags-Nr.: <i>Order No.:</i>	238108123	Seite 1 von 58 <i>Page 1 of 58</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	25-Jul-2019	
Auftraggeber: <i>Client:</i>	Siemens Healthcare Diagnostics Inc. 2 Edgewater Drive Norwood, MA 02062 USA			
Prüfgegenstand: <i>Test item:</i>	Mobile Computing Device			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	PD470SH-B, PD470SH-N			
Auftrags-Inhalt: <i>Order content:</i>	FCC Part 15E / Test report (WiFi 5GHz)			
Prüfgrundlage: <i>Test specification:</i>	FCC 47CFR Part 15: Subpart E Section 15.407(UNII)			
Wareneingangsdatum: <i>Date of receipt:</i>	30-Jul-2019	Refer to EUT photos.		
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000966214-002 A000966214-003			
Prüfzeitraum: <i>Testing period:</i>	01-Aug-2019 - 28-Aug-2019			
Ort der Prüfung: <i>Place of testing:</i>	EMC/RF Laboratory Taipei			
Prüflaboratorium: <i>Testing laboratory:</i>	TUV Rheinland Taiwan Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von / tested by:		kontrolliert von / reviewed by:		
28-Aug-2019 Mars Y. J. Lin / Project Engineer		29-Aug-2019 Arvin Ho/Vice General Manager		
Datum <i>Date(Report Date)</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>
				Unterschrift <i>Signature</i>
Sonstiges / Other: PD470SH-B and PD470SH-N use the same motherboard and RF Chip, the difference between PD470SH-B and PD470SH-N is that PD470SH-B more than PD470SH-N a barcode scanner function, both models have been considered, only the worst mode is listed.				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet				
Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: *Passed*

5.1.2 DUTY CYCLE

RESULT: *Passed*

5.1.3 MAXIMUM CONDUCTED AVERAGE OUTPUT POWER

RESULT: *Passed*

5.1.4 26dB & 99% BANDWIDTH

RESULT: *Passed*

5.1.5 6dB BANDWIDTH

RESULT: *Passed*

5.1.6 POWER DENSITY

RESULT: *Passed*

5.1.7 FREQUENCY STABILITY MEASUREMENT

RESULT: *Passed*

5.1.8 SPURIOUS EMISSION

RESULT: *Passed*

5.2.1 MAINS CONDUCTED EMISSIONS

RESULT: *Passed*

Contents

1.	GENERAL REMARKS	5
1.1	COMPLEMENTARY MATERIALS.....	5
2.	TEST SITES	6
2.1	TEST LABORATORY	6
2.2	TEST FACILITY.....	6
2.3	LIST OF TEST AND MEASUREMENT INSTRUMENTS.....	7
2.4	TRACEABILITY	8
2.5	CALIBRATION	8
2.6	MEASUREMENT UNCERTAINTY	8
3.	GENERAL PRODUCT INFORMATION.....	9
3.1	PRODUCT FUNCTION AND INTENDED USE	9
3.2	SYSTEM DETAILS AND RATINGS.....	9
3.3	INDEPENDENT OPERATION MODES.....	11
3.4	NOISE GENERATING AND NOISE SUPPRESSING PARTS	11
3.5	SUBMITTED DOCUMENTS.....	11
4.	TEST SET-UP AND OPERATION MODES.....	12
4.1	PRINCIPLE OF CONFIGURATION SELECTION	12
4.2	TEST OPERATION AND TEST SOFTWARE.....	13
4.3	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	14
4.4	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....	14
4.5	TEST SETUP DIAGRAM	14
5.	TEST RESULTS	16
5.1	TRANSMITTER REQUIREMENT & TEST SUITES.....	16
5.1.1	<i>Antenna Requirement</i>	<i>16</i>
5.1.2	<i>Duty Cycle.....</i>	<i>17</i>
5.1.3	<i>Maximum Conducted Average Output Power.....</i>	<i>20</i>
5.1.4	<i>26dB & 99% Bandwidth</i>	<i>22</i>
5.1.5	<i>6dB Bandwidth</i>	<i>32</i>
5.1.6	<i>Power Density</i>	<i>39</i>
5.1.7	<i>Frequency Stability Measurement</i>	<i>50</i>
5.1.8	<i>Spurious Emission</i>	<i>53</i>
5.2	MAINS EMISSIONS.....	54
5.2.1	<i>Mains Conducted Emissions.....</i>	<i>54</i>
6.	PHOTOGRAPHS OF THE TEST SET-UP.....	55

7.	LIST OF TABLES	58
8.	LIST OF PHOTOGRAPHS.....	58

1. General Remarks

1.1 Complementary Materials

These attachments are integral parts of this test report:

Appendix P: Photo Documentation internal view
(File Name: 50278814, 50278816, 50278817, 50278818, 50278819 001 Appendix P)

Appendix D: Test Result of Radiated Emissions
(File Name: 50278819 001 Appendix D)

Test Specifications

The following standards were applied.

The decision rule of conformity of this test report is following the requirements of the requested standard in the quotation, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty, unless it is required by the specific standard.

Table 1: Applied Standard and Test Levels

Radio
FCC CFR47 Part 15: Subpart E Section 15.407 ANSI C63.10:2013 KDB789033 D02 General UNII Test Procedures New Rules v02r01

2. Test Sites

2.1 Test Laboratory

TUV Rheinland Taiwan Ltd.
Taipei Testing Laboratories

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

2.2 Test Facility

TUV Rheinland Taiwan Ltd.

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

FCC Registration No.: 180491
IC Canada Registration No.: 9465A
TAF Accredited NCC Test Lab. No.:3567
TAF ISO17025 Certification effective period: 6th-May-2019 to 05th-May-2022



Testing Laboratory
3567

2.3 List of Test and Measurement Instruments

Table 2: List of Test and Measurement Equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESR 7	101062	2018/10/01	2019/10/01
Spectrum Analyzer	Rohde & Schwarz	FSV-40	101514	2019/02/07	2020/02/07
Pre-Amplifier	Hewlett Packard	8447F	2805A03335	2019/08/22	2020/08/22
Pre-Amplifier	EM Electronics	EM01G18G	060558	2018/11/30	2019/11/30
Pre-Amplifier	EMC Instruments	EMC184045S E	980652	2019/02/25	2020/02/25
Bilog Antenna	TESEQ	CBL 6111D	29802	2019/08/22	2020/08/22
Horn Antenna	ETS-Lindgren	3117	00218931	2018/12/27	2019/12/27
Horn Antenna	Com-Power	AH-840	101029	2018/12/22	2019/12/22
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	2019/07/11	2020/07/11
Test Software	Audix	e3	Ver. 9	N/A	N/A
Spectrum Analyzer	Agilent	N9010A	MY53470241	2019/06/17	2020/06/17
Power Meter	Anritu	ML2495A	1901008	2019/04/29	2020/04/29
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100797	2019/01/16	2020/01/16
Two-Line V-Network	Rohde & Schwarz	ENV216	101243	2019/06/23	2020/06/23
Telecom ISN 2 Line	Fischer Custom Communications	FCC-TLISN-T2-02-09	101169	2019/08/24	2020/08/24
Telecom ISN 4 Line	Fischer Custom Communications	FFCC-TLISN-T4-02-09	101168	2019/01/02	2020/01/02
Impedance Stabilization Network	TESEQ	ISN T800	51949	2019/02/20	2020/02/20

2.4 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.5 Calibration

Equipment requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular schedule using in house standards or comparisons.

2.6 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements .

Table 3: Emission Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 0.1 ppm
RF power, conducted	± 1.5 dB
RF power density, conducted	± 3 dB
spurious emissions, conducted	± 3 dB
all emissions, radiated	± 6 dB
Temperature	± 1 °C
Humidity	± 5 %
DC and low frequency voltages	±3 %

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a Mobile Computing Device. It contains a WiFi 5G compatible module enabling the user to communicate data through a Wireless interface.
 For details refer to the User Guide, Data Sheet and Block Diagram.

3.2 System Details and Ratings

Table 4: Basic Information of EUT

Item	EUT information
Kind of Equipment/Test Item	Mobile Computing Device
Type Identification	PD470SH-B, PD470SH-N
Brand Name	Siemens Healthcare Diagnostics
FCC ID	2AUAM-PD470SH

Table 5: Technical Specification of EUT

Technical Specification	Value
Operating Frequencies	Band 1: 20M(5180-5240MHz), 40M(5190-5230MHz), 80M(5210MHz) Band 4: 20M(5745-5825MHz), 40M(5755-5795MHz), 80M(5775MHz)
Channel Spacing	10 MHz
Channel number	9 for 20MHz bandwidth ; 4 for 40MHz bandwidth ; 2 for 80MHz bandwidth ;
Operation Voltage	5Vdc
Modulation	802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM,
Antenna gain	2.02dBi
Product Type	802.11a: WLAN (1TX , 1RX) 802.11n: WLAN (1TX , 1RX) 802.11ac: WLAN (1TX , 1RX)

Table 6: Channel Frequency Table

Band	Channel	Frequency (MHz)	Bandwidth 20M	Bandwidth 40M	Bandwidth 80M
U-NII-1 (Band 1)	36	5180	V		
	38	5190		V	
	40	5200	V		
	42	5210			V
	44	5220	V		
	46	5230		V	
	48	5240	V		
U-NII-3 (Band 4)	149	5745	V		
	151	5755		V	
	153	5765	V		
	155	5775			V
	157	5785	V		
	159	5795		V	
	161	5805	V		
	165	5825	V		

3.3 Independent Operation Modes

Basic operation modes are:

- A. Transmitting
- B. Receiving
- C. Normal
- D. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Block Diagram.

3.5 Submitted Documents

- Block Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The test modes were adapted accordingly in reference to the instructions for use.

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Table 7: Table for Parameters of Test Software Setting

UNII Band	NCB: 20MHz			NCB: 40MHz		NCB: 80MHz	
	Channel	Mode		Channel	Mode	Channel	Mode
		802.11a Setting	802.11ac Setting		802.11ac Setting		802.11ac Setting
Band 1	36	19	19	38	19	42	18
	40	18	18	46	18		
	48	18	18				
Band 4	149	20	20	151	20	155	10
	157	20	20	159	20		
	165	19	19				

4.2 Test Operation and Test Software

Setup for testing: The test sample itself is equipped with a touch screen, It was used to enable the operation modes listed in section 3.3 as appropriate by the screen.

The samples were used as follows:

Conducted: A000966214-003

Radiation: A000966214-002

The modulation and bandwidth are similar for 802.11n mode for 20MHz/40MHz and 802.11ac mode for 20MHz/40MHz, therefore investigated worst case to representative mode in test report.

Full test was applied on all test modes, but only worst case was shown

IEEE 802.11a mode:

Band 1 Channel Low (5180MHz), Channel Mid (5200MHz) and Channel High (5240MHz) with 6Mbps data rate were chosen for full testing.

Band 4 Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11ac VHT20 mode:

Band 1 Channel Low (5180MHz), Channel Mid (5200MHz) and Channel High (5240MHz) with MCS0/NSS1 data rate were chosen for full testing.

Band 4 Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with MCS0/NSS1 data rate were chosen for full testing.

IEEE 802.11ac VHT40 mode:

Band 1 Channel Low (5190MHz) and Channel High (5230MHz) with MCS0/NSS1 data rate were chosen for full testing.

Band 4 Channel Low (5755MHz) and Channel High (5795MHz) with MCS0/NSS1 data rate were chosen for full testing.

IEEE 802.11ac VHT80 mode:

Band 1 Channel Low (5120MHz) with MCS0/NSS1 data rate were chosen for full testing.

Band 4 Channel Low (5775MHz) with MCS0/NSS1 data rate were chosen for full testing.

4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

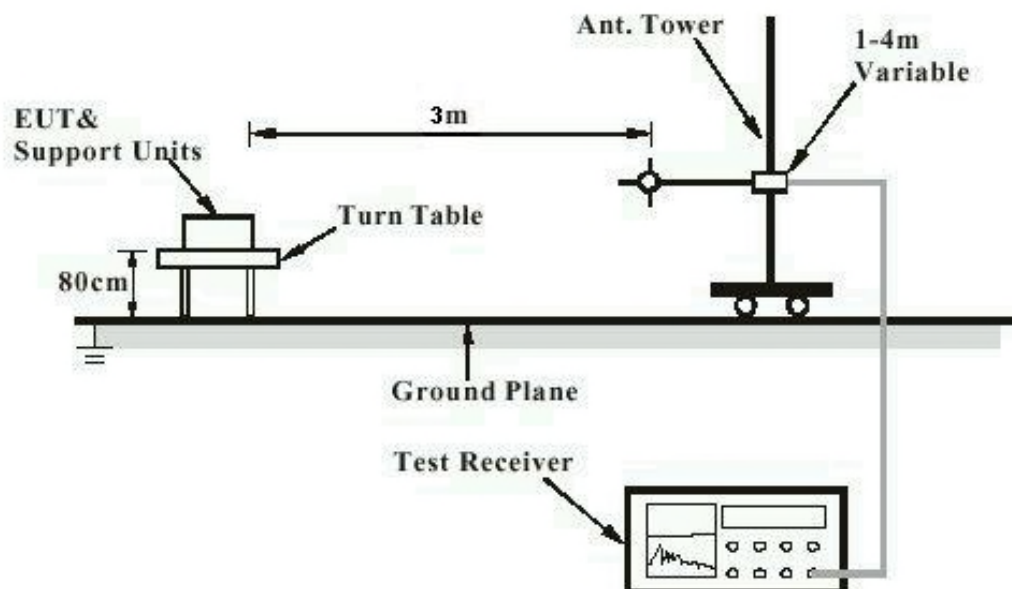
Kind of Equipment	Manufacturer	Model Name	S/N
Adapter	Topcom	TC-S300Q	T0119

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1 GHz are done with a table height of 1.5m

Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)

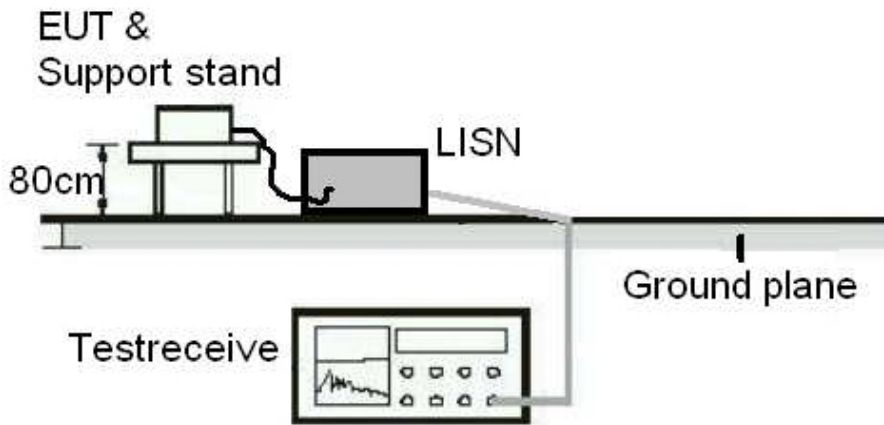
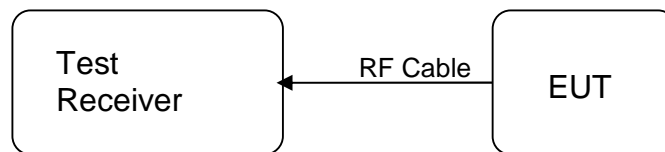


Diagram of Measurement Equipment Configuration for Conducted Transmitter Measurement



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Passed**

Test standard : FCC Part 15.407(a), Part 15.203

Requirement : use of approved antennas only with directional gains that do not exceed 6 dBi

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 2.02 dBi. The antenna is a printed trace with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

5.1.2 Duty Cycle

RESULT:
Passed

Test standard : KDB 789033 Zero-Span Spectrum Analyzer Method
 Limit : None; for reporting purposes only
 Kind of test site : Shielded room / Conducted room

Test setup

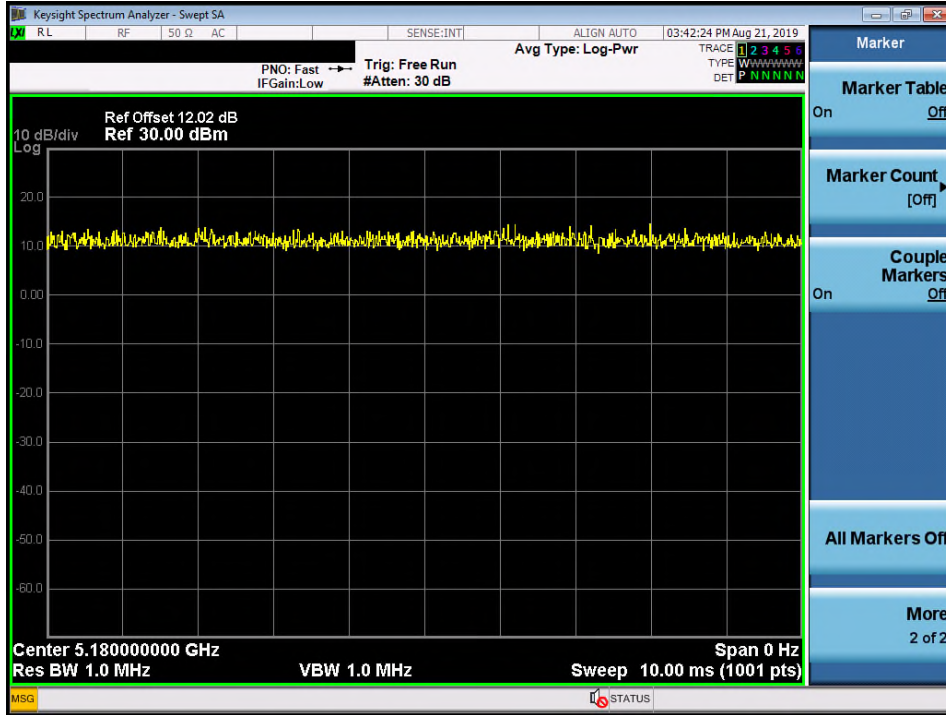
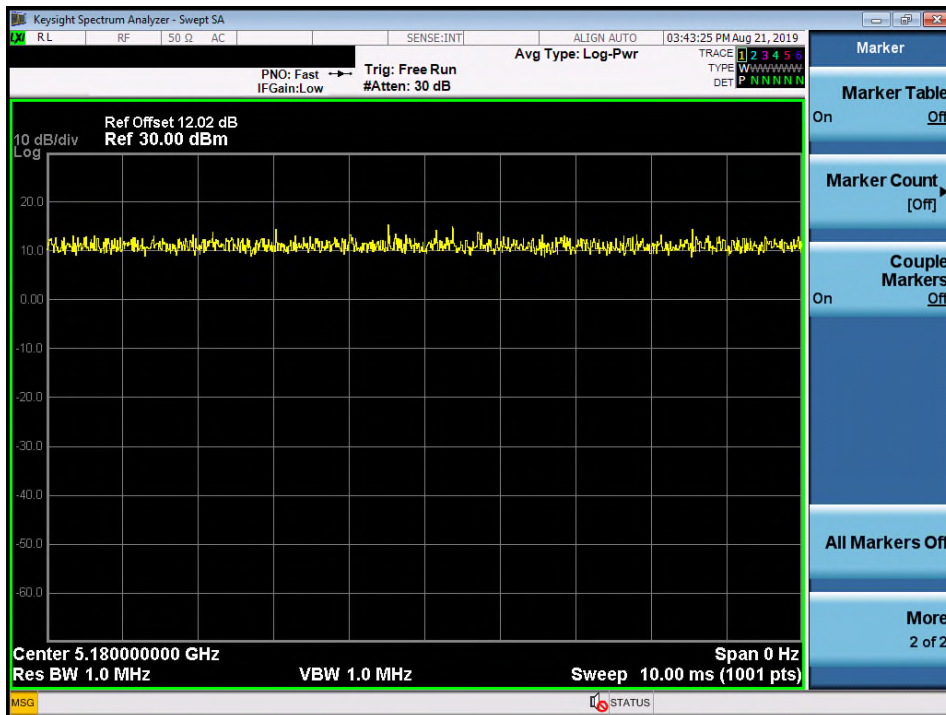
Operation Mode : A
 Test Channel : Refer to the Table (Band 1 low channel)

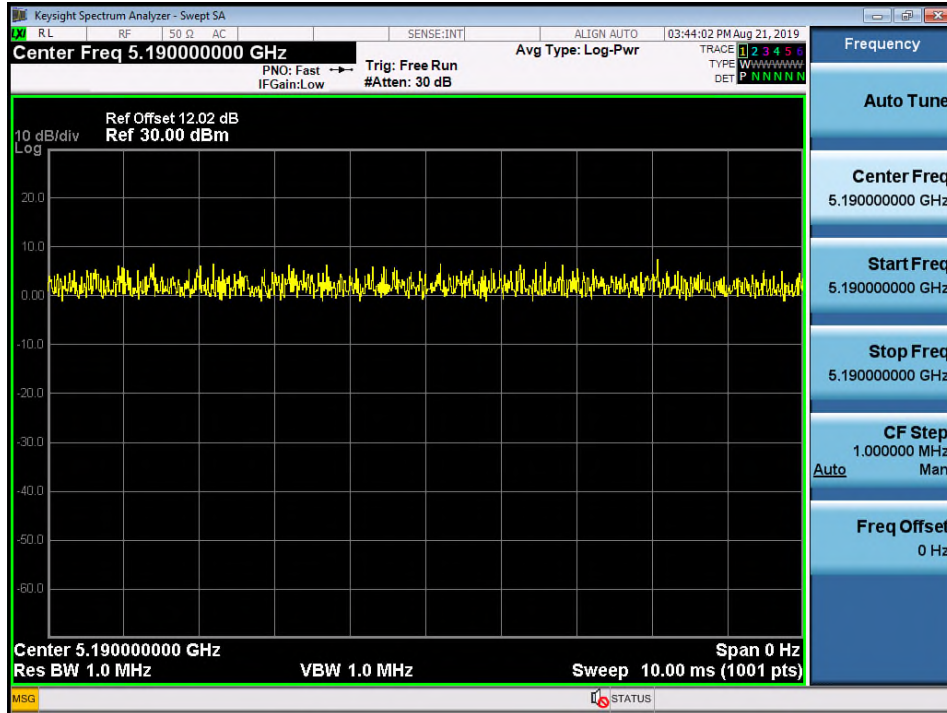
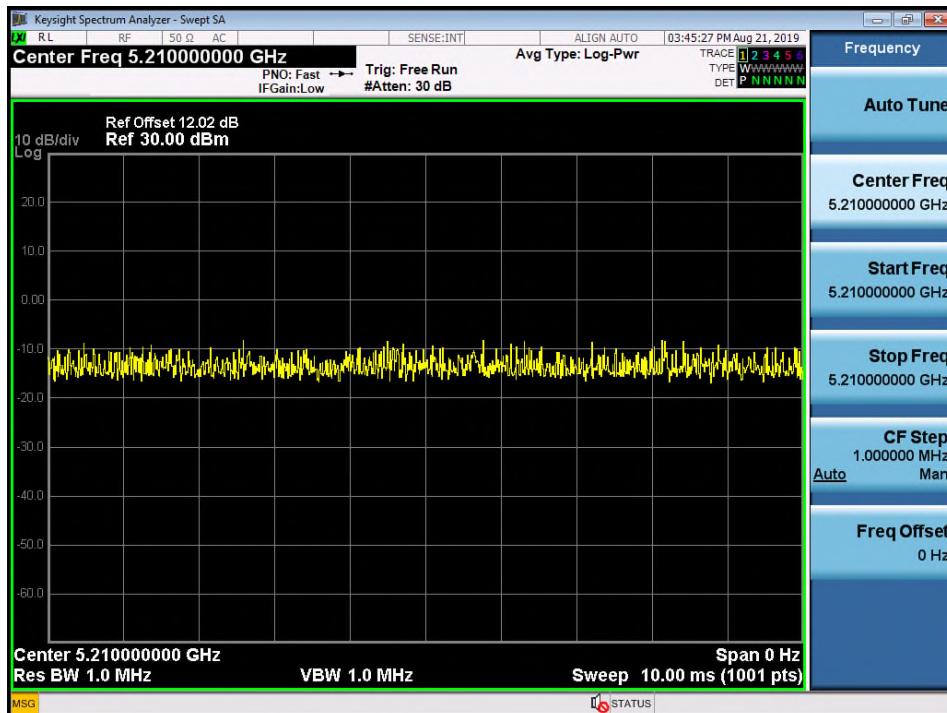
Table 8: Test result of Duty Cycle

Mode	On Time(ms)	On+Off Time(ms)	Duty Cycle (%)	Duty Factor (dB)
802.11a	1	1	100	0.00
802.11ac VHT20	1	1	100	0.00
802.11ac VHT40	1	1	100	0.00
802.11ac VHT80	1	1	100	0.00

The duty factor is $10\log(1/(\text{Duty Cycle}(\%) / 100))$.

Test Plot of Duty Cycle

802.11a

802.11ac VHT20


802.11ac VHT40

802.11ac VHT80


5.1.3 Maximum Conducted Average Output Power

RESULT:**Passed**

Test standard : FCC Part 15.407(a)
Basic standard : ANSI C63.10:2013
Kind of test site : Shielded room

Test setup

Test Channel : Refer to the Table 7
Operation Mode : A

Ambient temperature : 20-24 °C
Relative humidity : 50-65 %
Atmospheric pressure : 100-103 kPa

FCC Limit

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

Table 9: FCC Test result of Average Output Power

Mode	Channel Frequency (MHz)	Average Output Power		Limit (dBm)
		(dBm)	Total (dBm)	
802.11a	5180	16.00	16.00	24.00
	5200	15.53	15.53	24.00
	5240	15.46	15.46	24.00
	5745	16.43	16.43	30.00
	5785	15.89	15.89	30.00
	5825	16.46	16.46	30.00
802.11ac VHT20	5180	15.80	15.80	24.00
	5200	15.98	15.98	24.00
	5240	15.84	15.84	24.00
	5745	16.38	16.38	30.00
	5785	15.92	15.92	30.00
	5825	16.35	16.35	30.00
802.11ac VHT40	5190	15.99	15.99	24.00
	5230	15.83	15.83	24.00
	5755	16.15	16.15	30.00
	5795	16.48	16.48	30.00
802.11ac VHT80	5210	15.48	15.48	24.00
	5775	5.87	5.87	30.00

5.1.4 26dB & 99% Bandwidth

RESULT:
Passed

Test standard : FCC Part 15.407(a)
 Basic standard : ANSI C63.10:2013
 Kind of test site : Conducted room

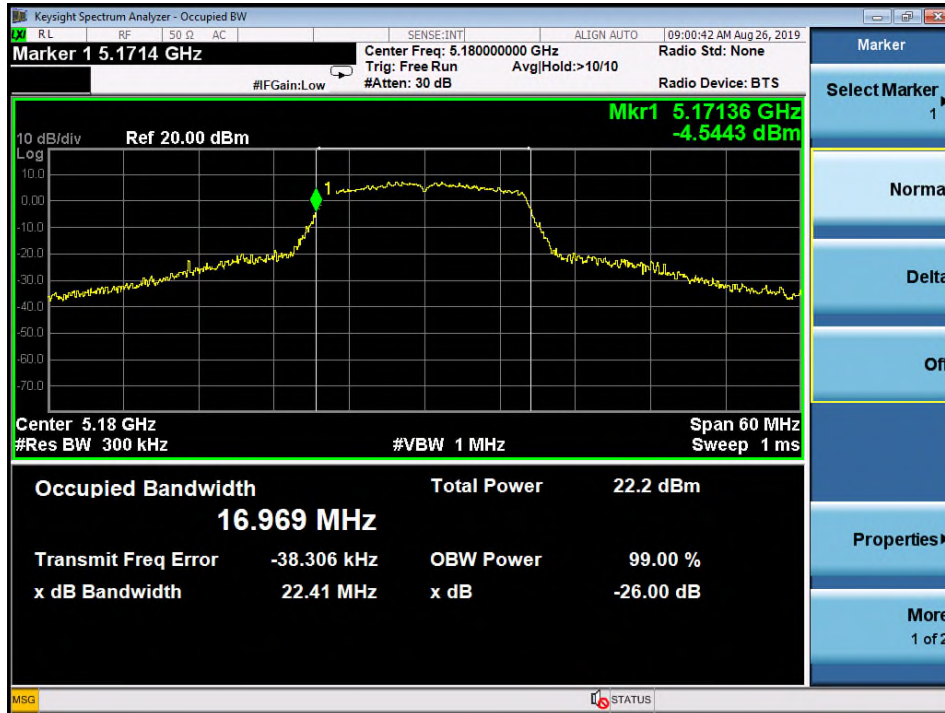
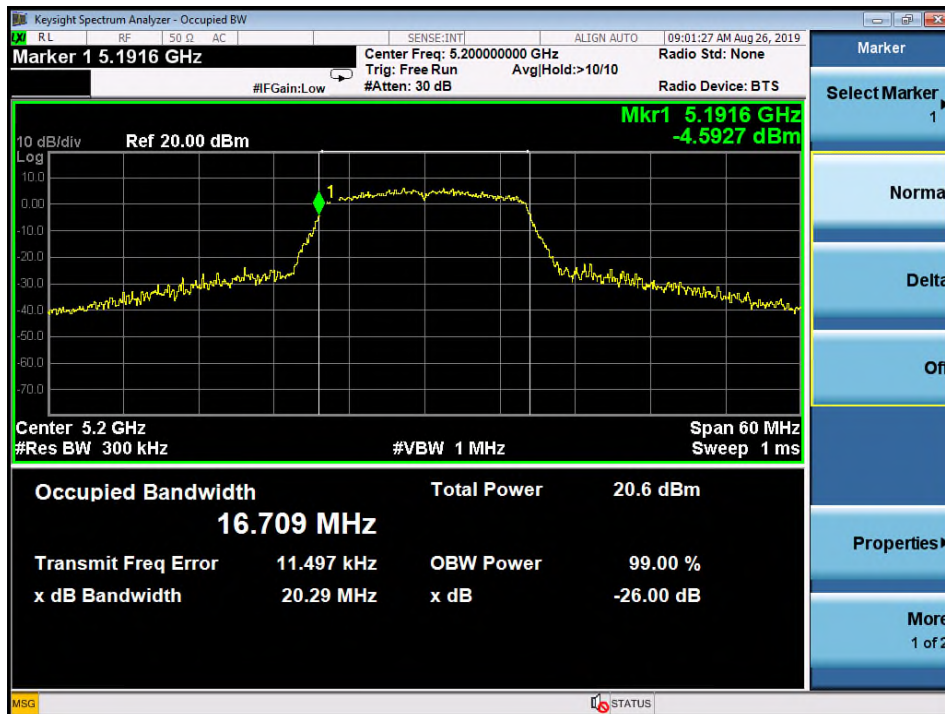
Test setup

Test Channel : Refer to the Table 7
 Operation Mode : A

Table 10: Test result of 26dB & 99% Bandwidth

Mode	Channel Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
802.11a	5180	22.41	16.97
	5200	20.29	16.71
	5240	20.17	16.74
	5745	24.77	16.97
	5785	27.74	16.95
	5825	22.34	16.67
802.11ac VHT20	5180	21.87	17.77
	5200	20.51	17.78
	5240	20.55	17.68
	5745	25.74	17.93
	5785	26.35	17.94
	5825	24.08	17.84
802.11ac VHT40	5190	41.73	36.62
	5230	41.75	36.43
	5755	58.49	37.00
	5795	61.55	36.80
802.11ac VHT80	5210	81.40	75.40
	5775	81.55	75.90

Test Plot of 26dB & 99% Bandwidth

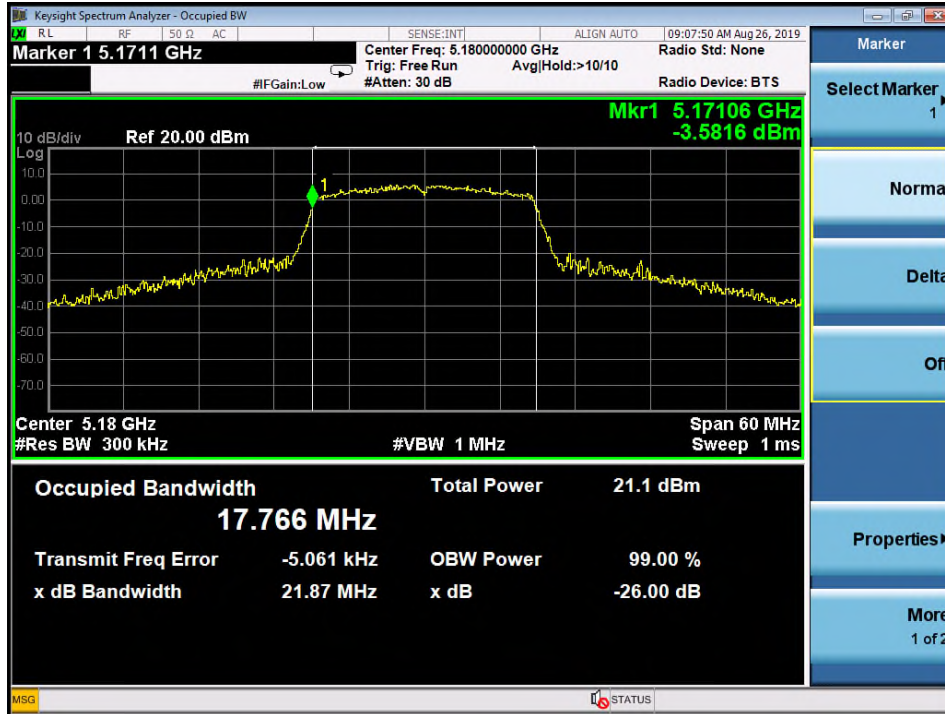
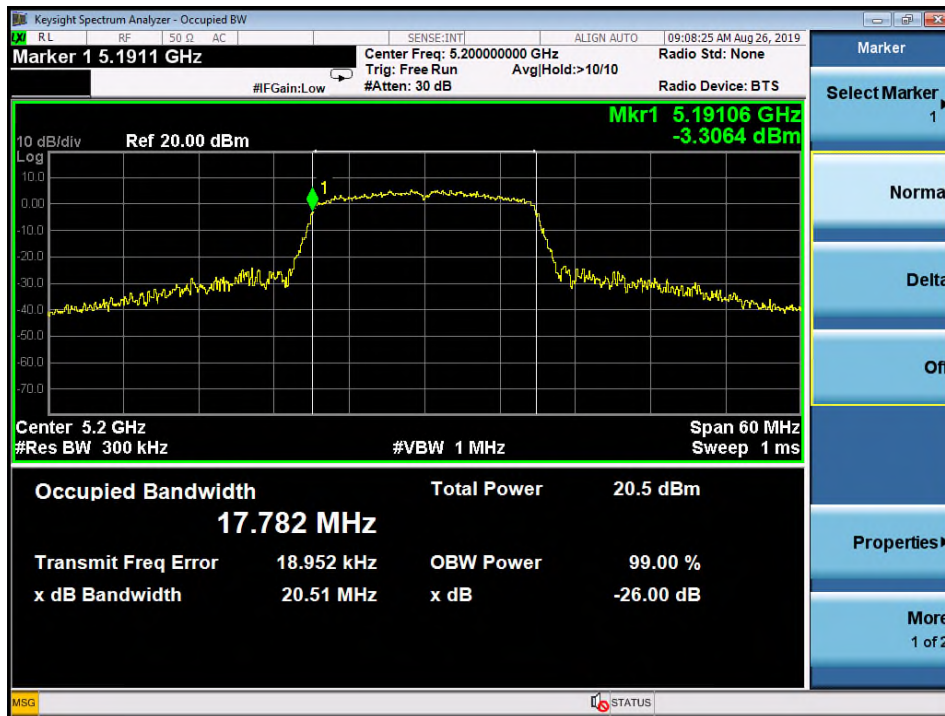
802.11a 5180MHz

802.11a 5200MHz


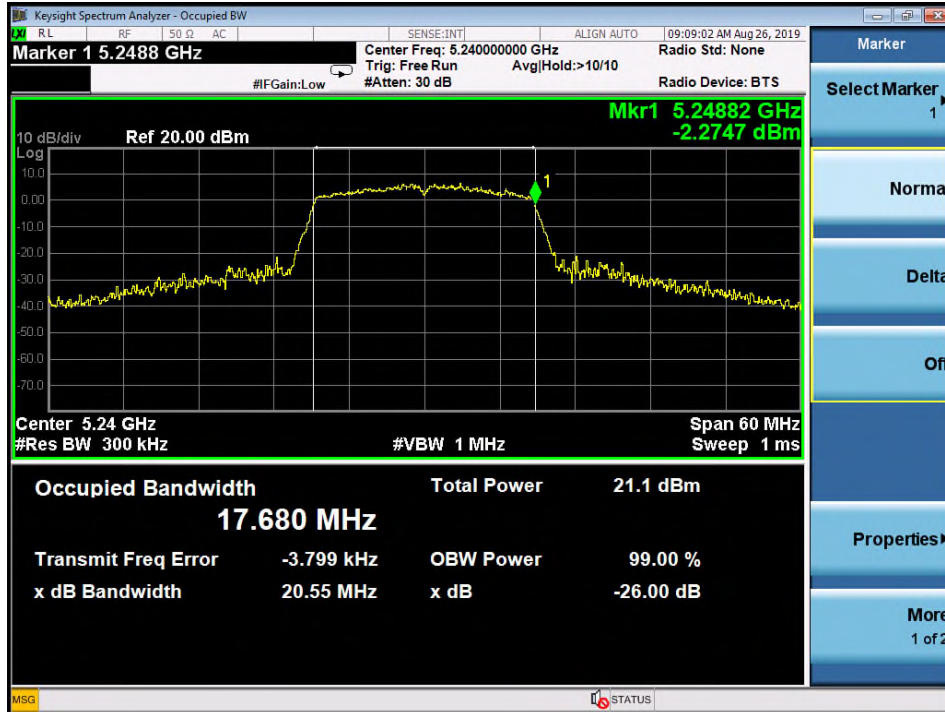
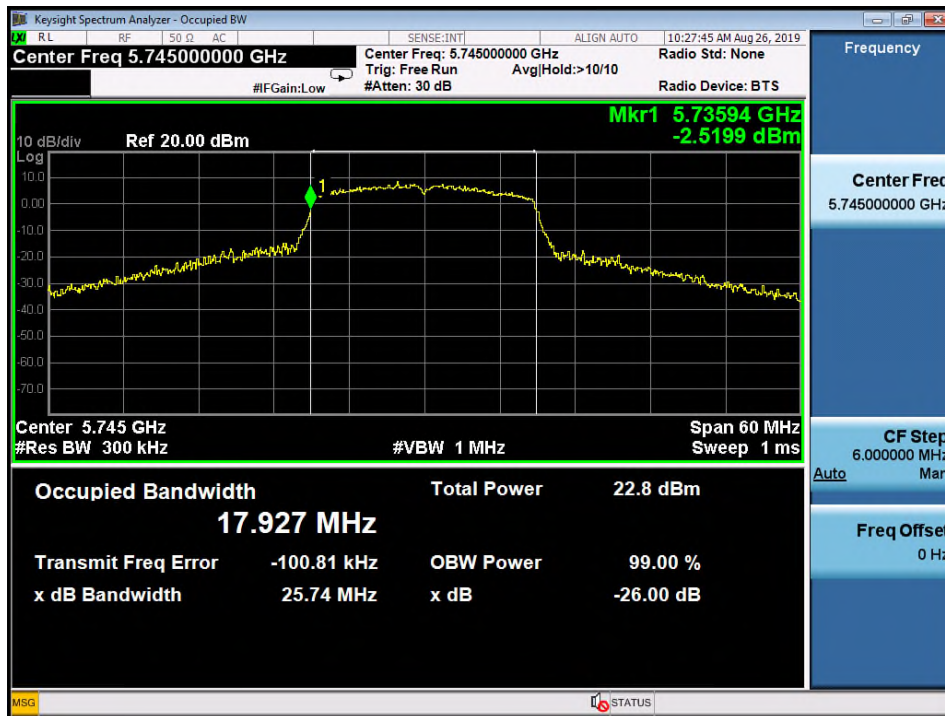
802.11a 5240MHz

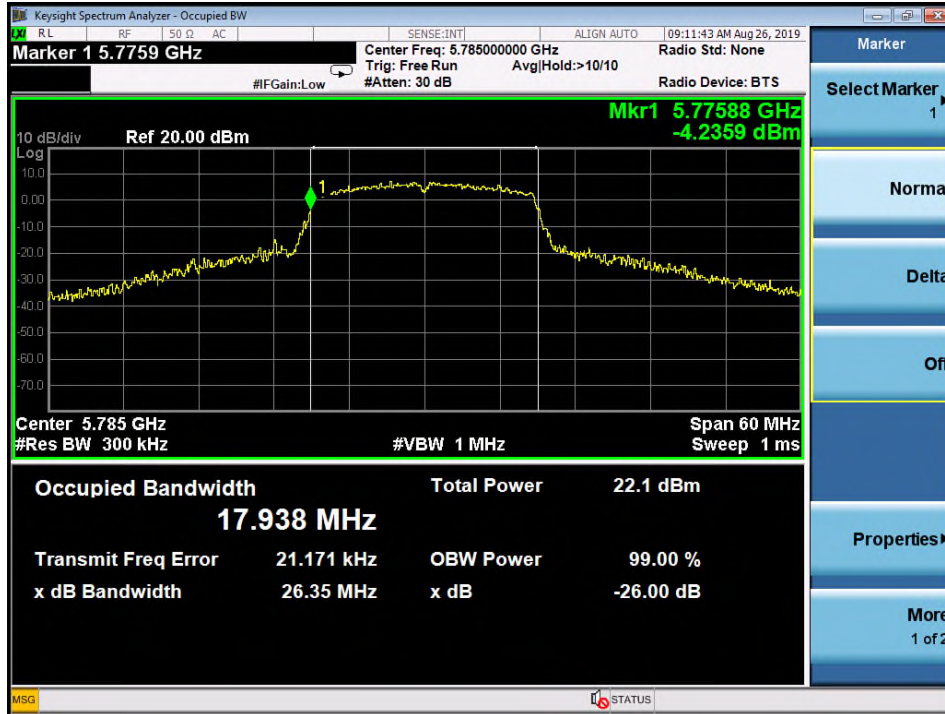
802.11a 5745MHz

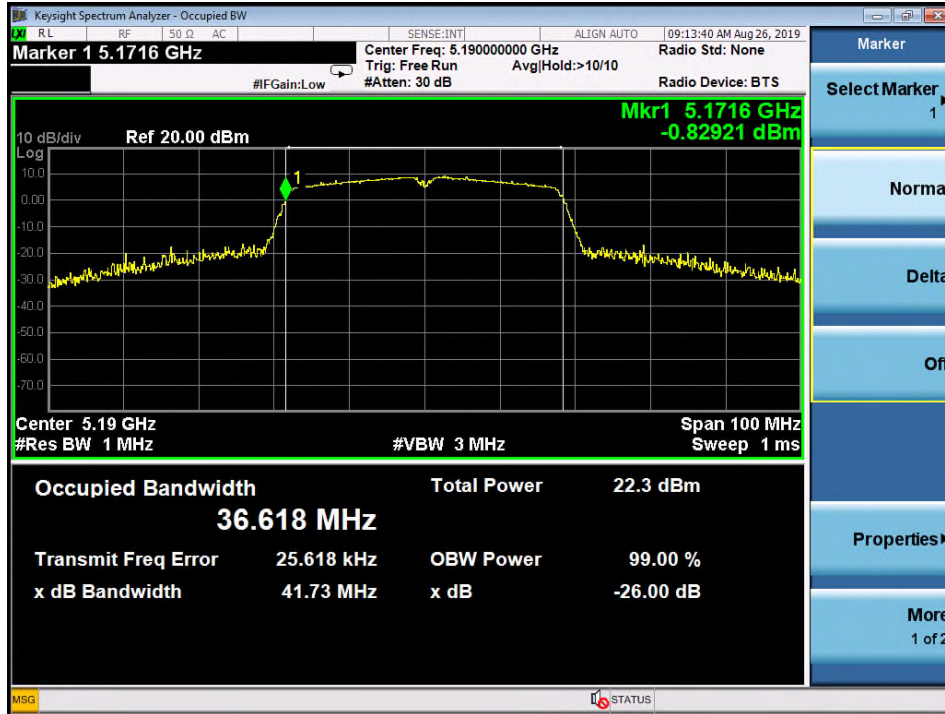
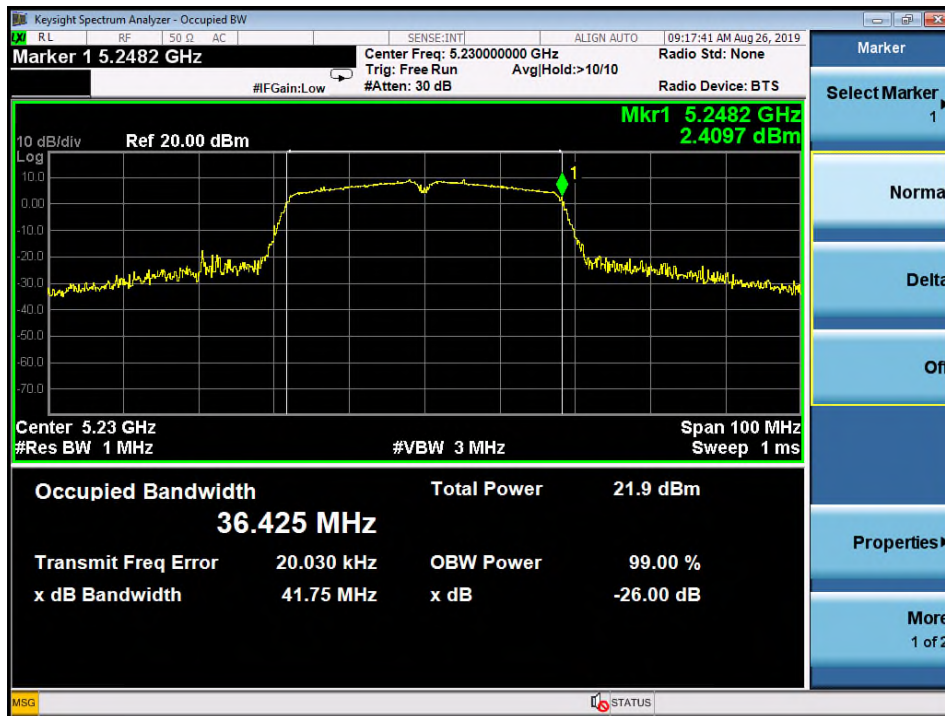

802.11a 5785MHz

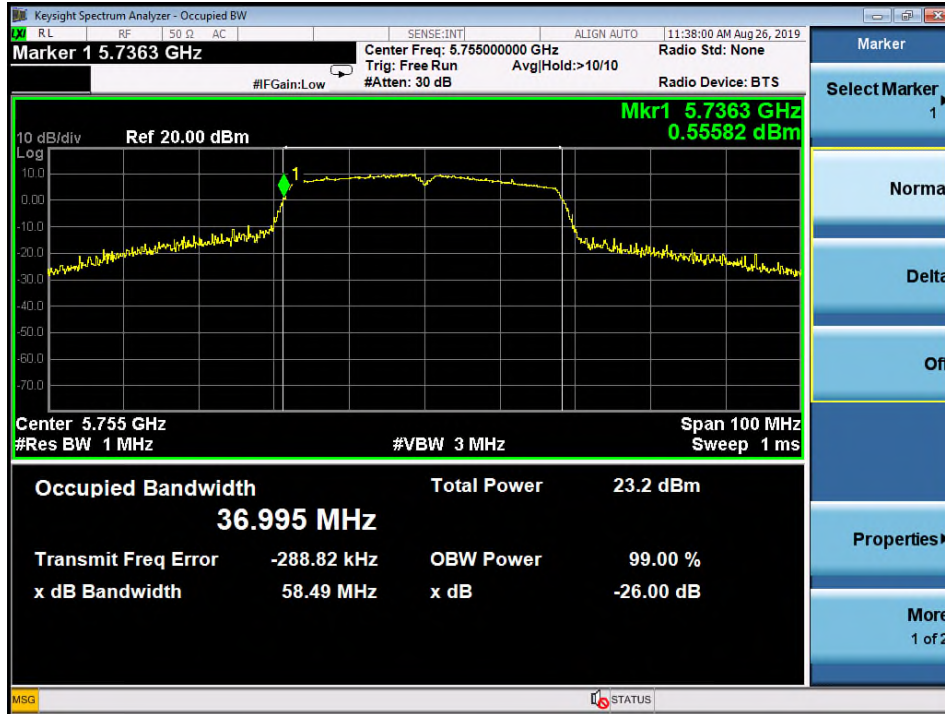
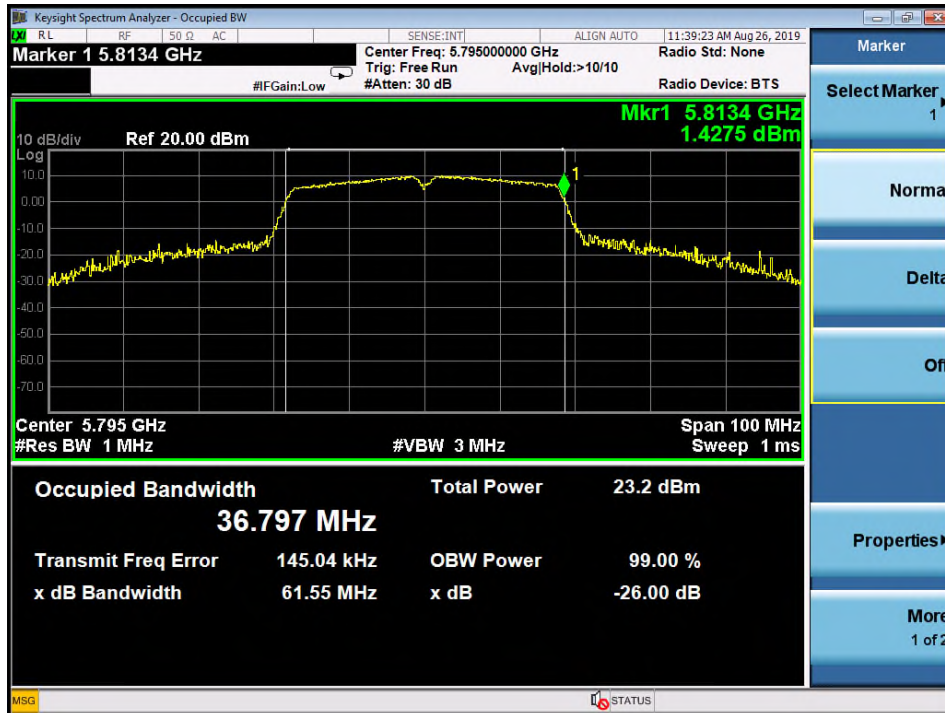
802.11a 5825MHz

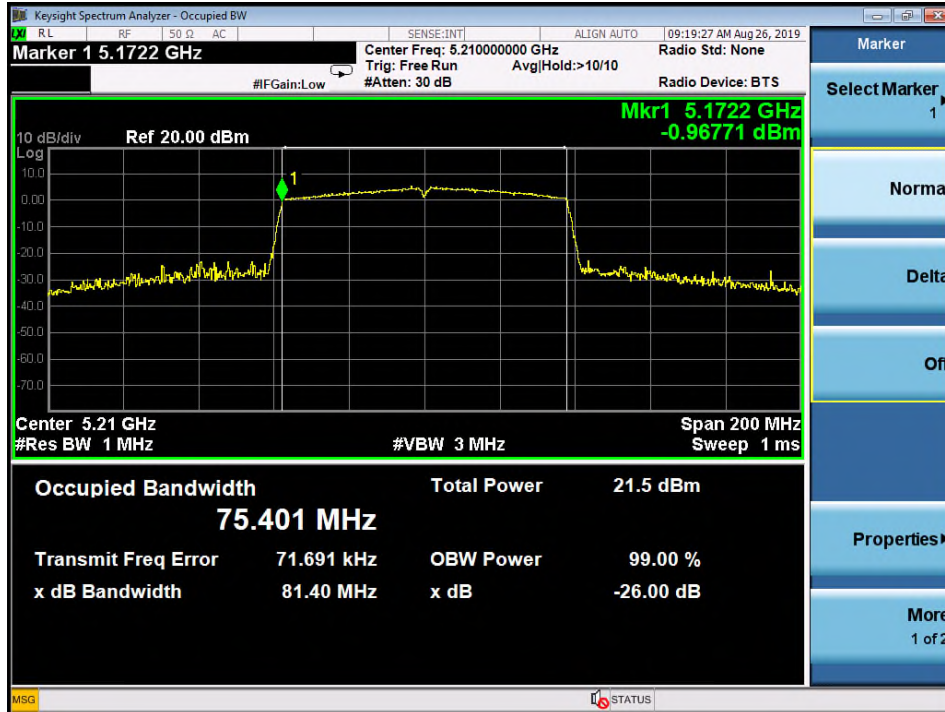
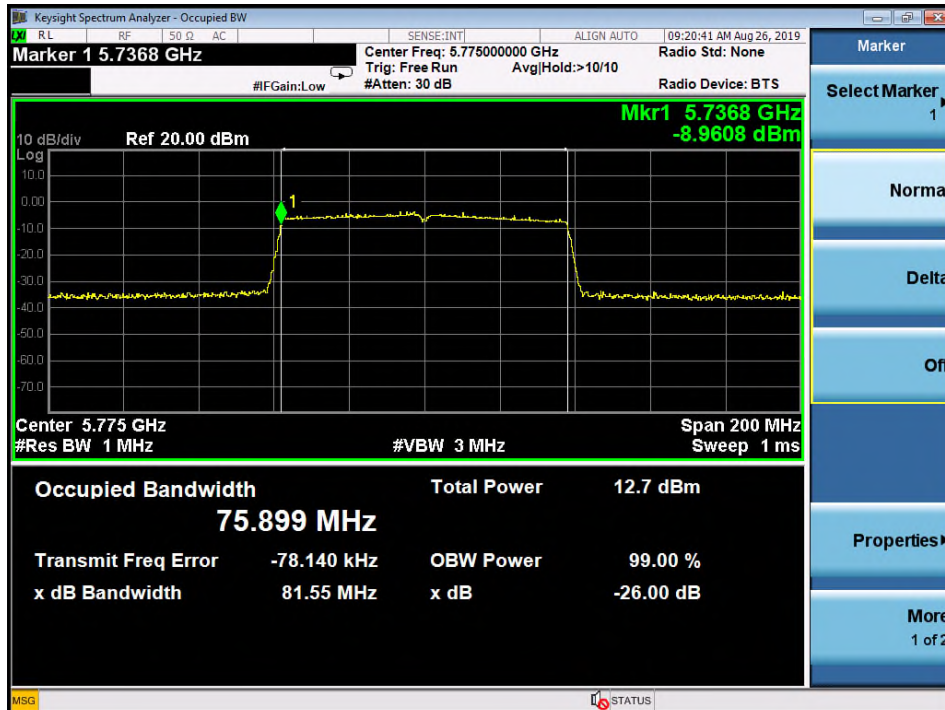

802.11ac VHT20 5180MHz

802.11ac VHT20 5200MHz


802.11ac VHT20 5240MHz

802.11ac VHT20 5745MHz


802.11ac VHT20 5785MHz

802.11ac VHT20 5825MHz


802.11ac VHT40 5190MHz

802.11ac VHT40 5230MHz


802.11ac VHT40 5755MHz

802.11ac VHT40 5795MHz


802.11ac VHT80 5210MHz

802.11ac VHT80 5775MHz


5.1.5 6dB Bandwidth

RESULT:
Passed

Test standard : FCC Part 15.407
 Limit : FCC Part 15.407
 Basic standard : ANSI C63.10:2013
 Kind of test site : Conducted room

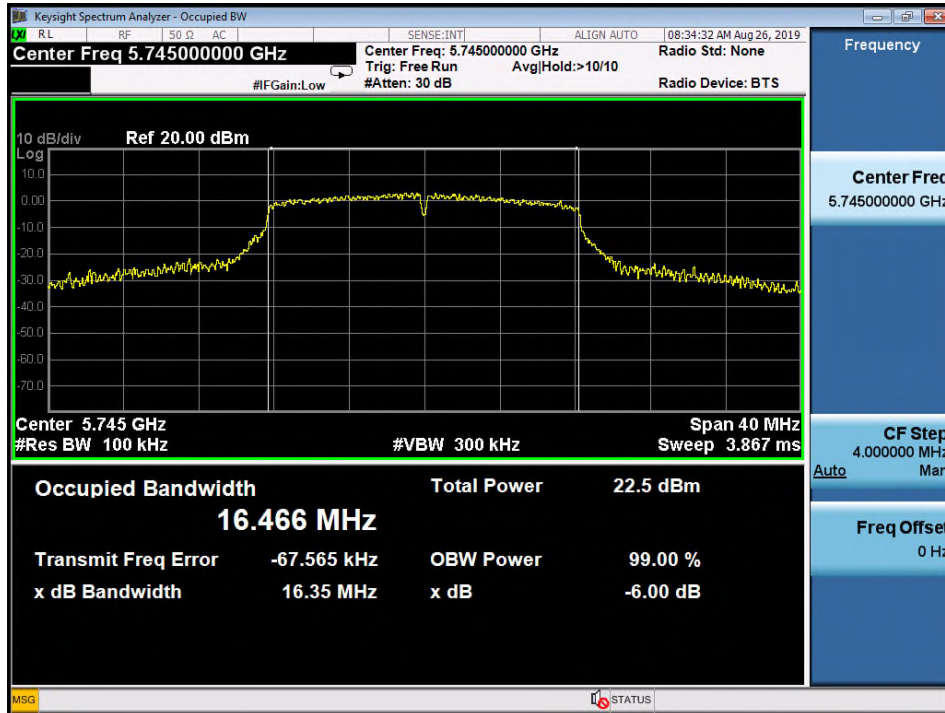
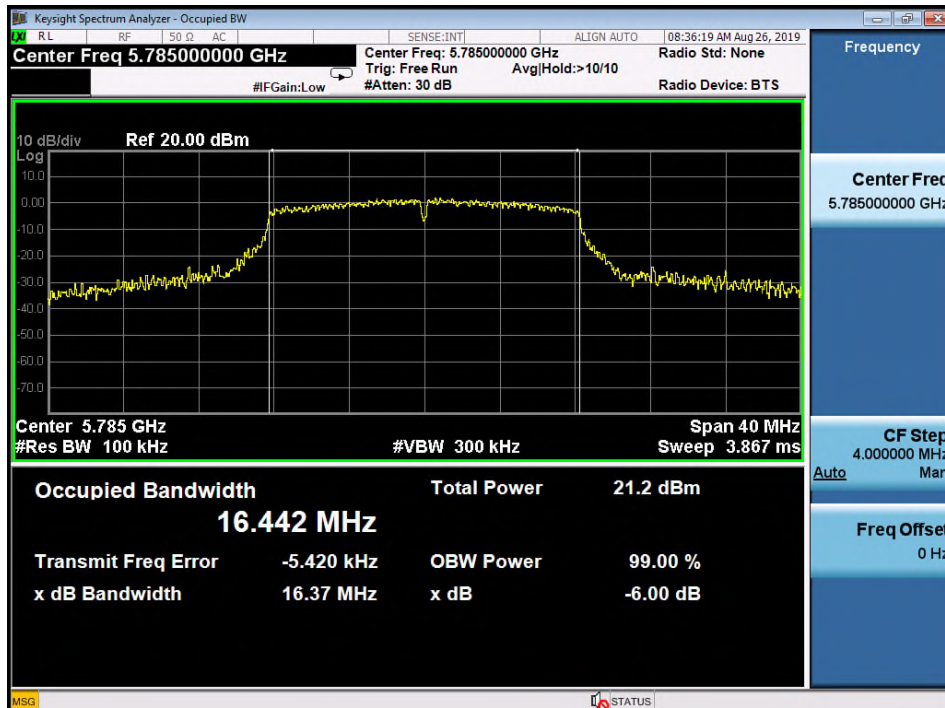
Test setup

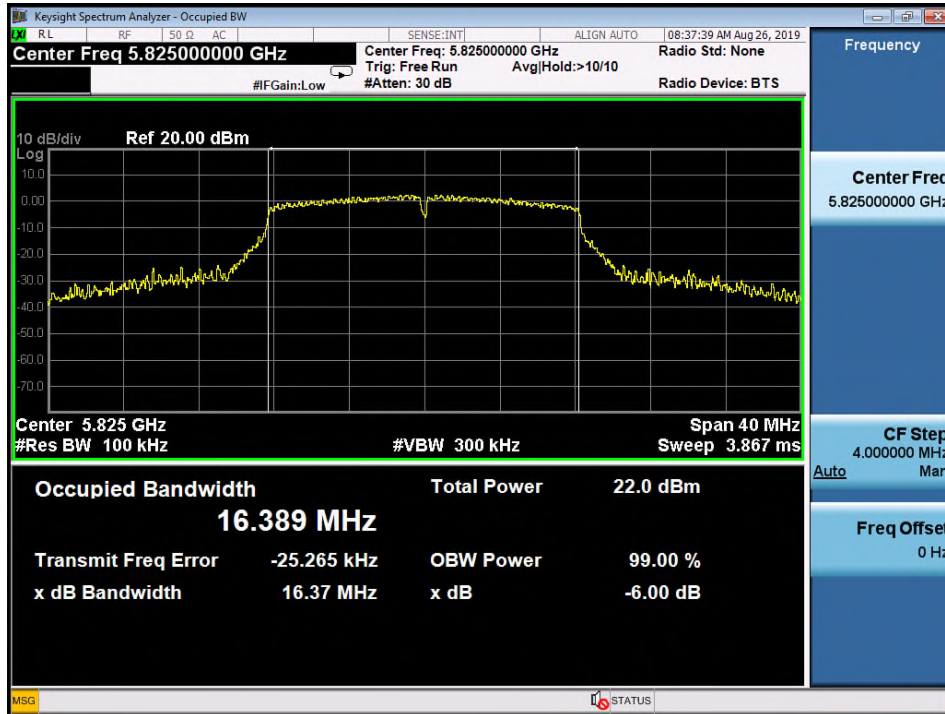
Test Channel : Refer to the Table 7
 Operation Mode : A

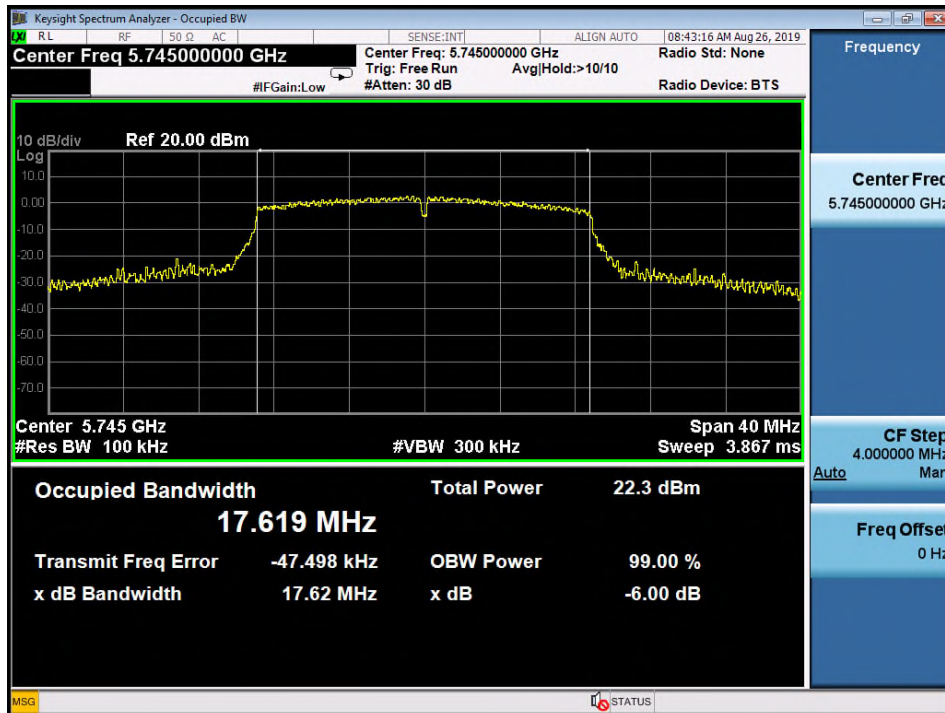
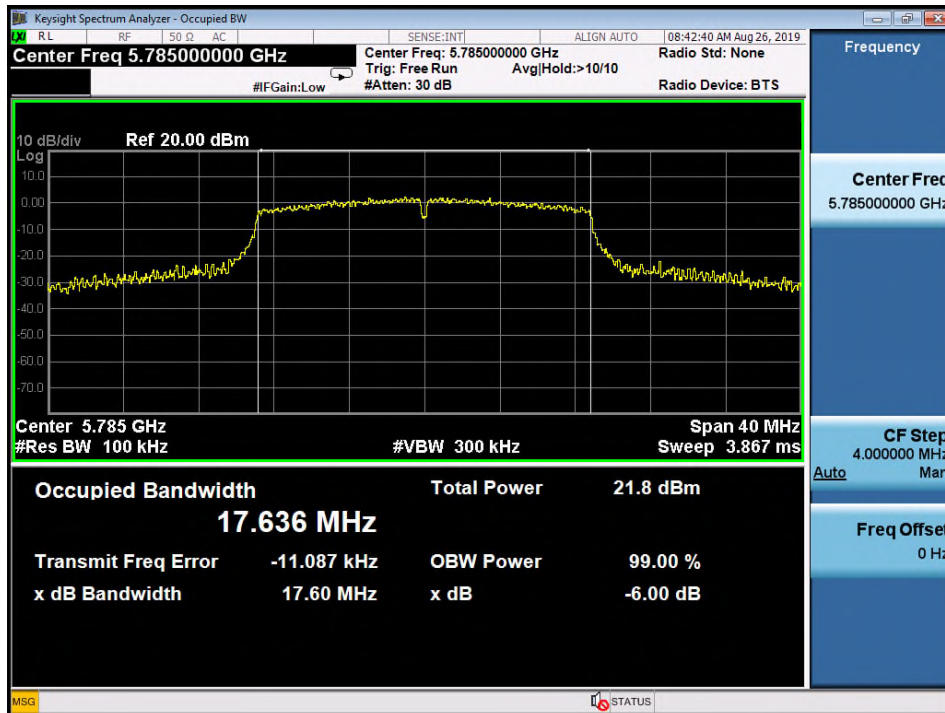
Table 11: Test result of 6dB Bandwidth

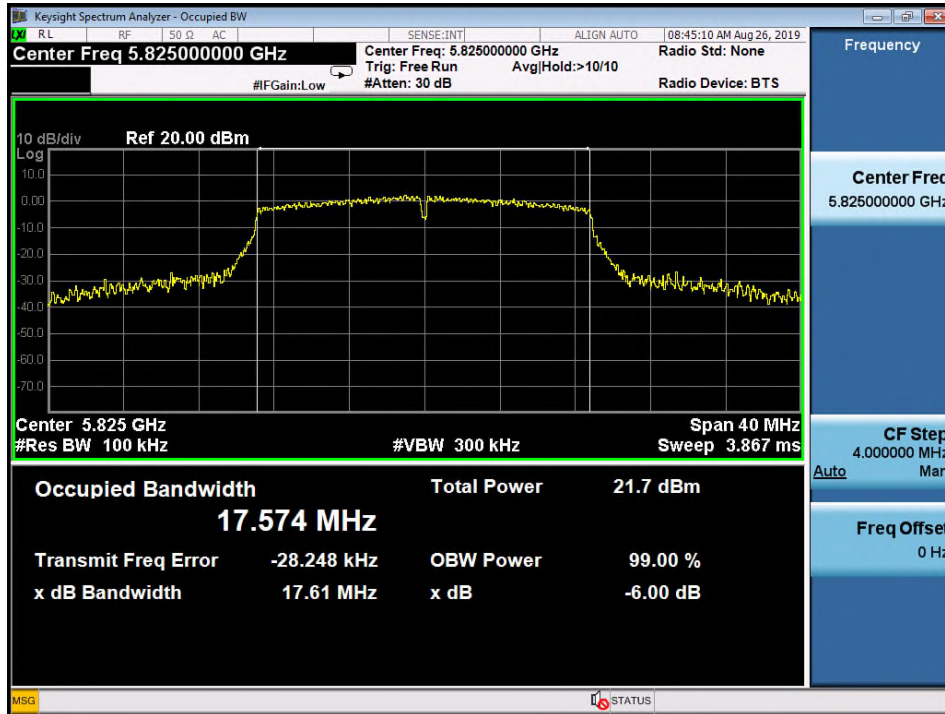
Mode	Channel Frequency (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Limit (kHz)	Result
802.11a	5745	16.35	>500	Pass
	5785	16.37	>500	Pass
	5825	16.37	>500	Pass
802.11ac VHT20	5745	17.62	>500	Pass
	5785	17.60	>500	Pass
	5825	17.61	>500	Pass
802.11ac VHT40	5755	36.05	>500	Pass
	5795	36.11	>500	Pass
802.11ac VHT80	5775	76.57	>500	Pass

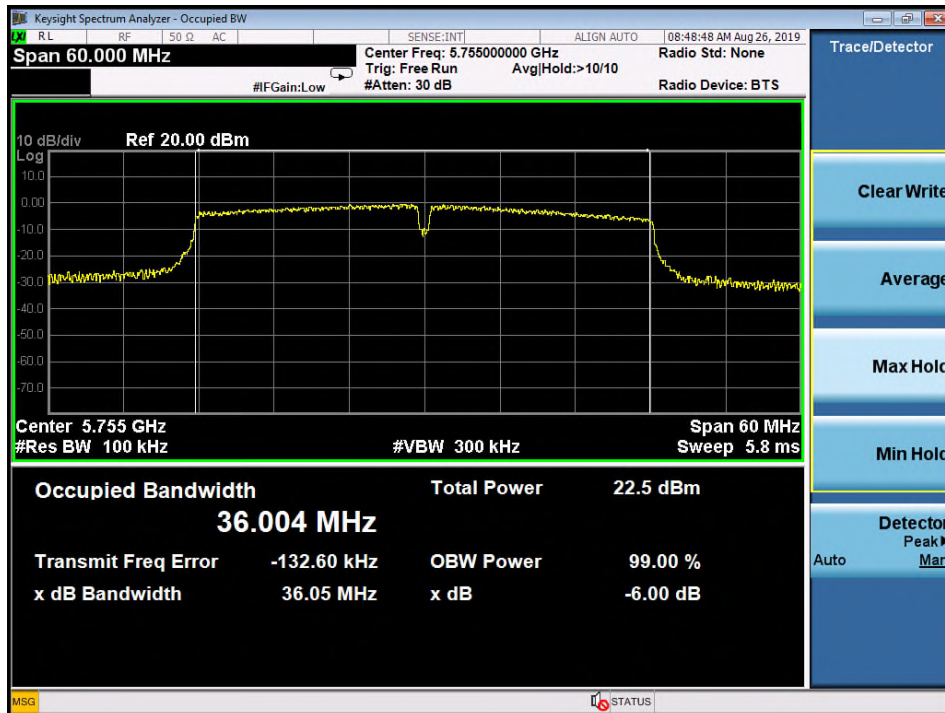
Test Plot of 6dB Bandwidth

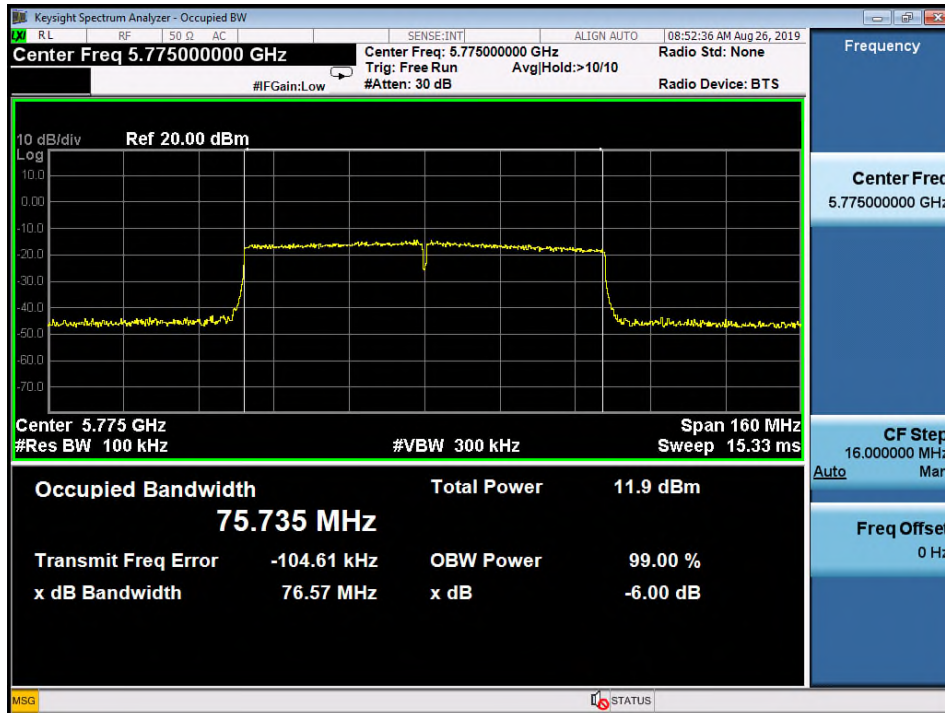
802.11a
5745MHz

5785MHz


5825MHz


802.11ac VHT20
5745MHz

5785MHz


5825MHz


802.11ac VHT40
5755MHz

5795MHz


802.11ac VHT80
5755MHz


5.1.6 Power Density

RESULT:**Passed**

Test standard : FCC Part 15.407(a)(1),(3)
Basic standard : ANSI C63.10:2013, KDB789033 D02
Kind of test site : Shielded room

Test setup

Test Channel : Refer to the table 7
Operation Mode : A

FCC Limit :

For client devices in the 5.15-5.25 GHz band, the maximum conducted power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For the band 5.725-5.85 GHz, the maximum conducted power spectral density shall not exceed 30 dBm in any 500-kHz band.

ISED Limit :

For client devices in the 5.15-5.25 GHz band, The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

For the band 5.725-5.85 GHz, the maximum conducted power spectral density shall not exceed 30 dBm in any 500-kHz band.

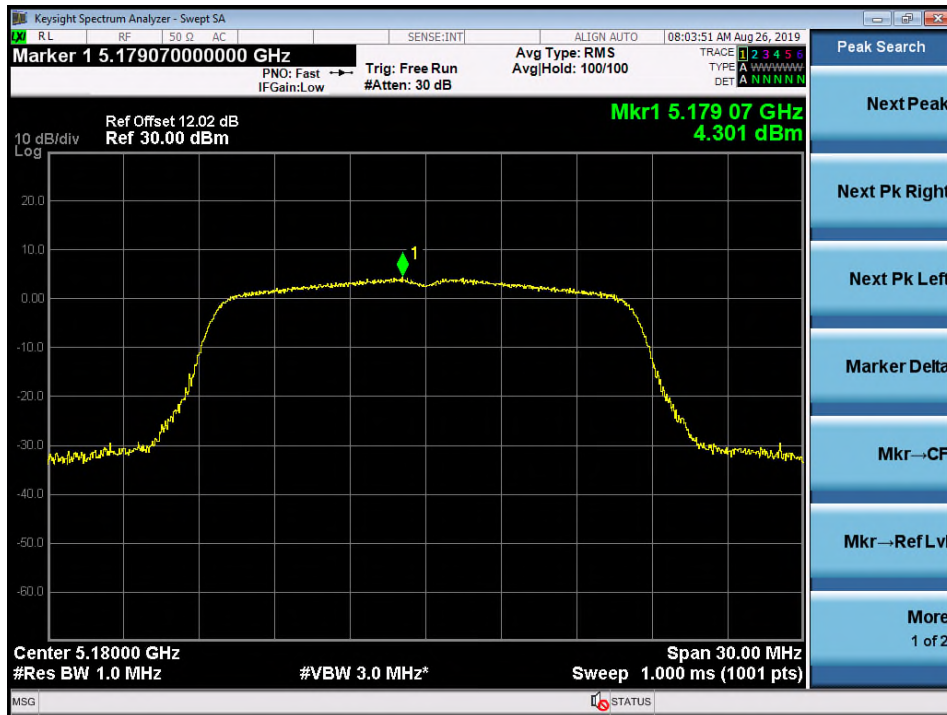
Table 12: Test result of FCC Power Density

Mode	Channel Frequency (MHz)	Conducted Power Density			Power Density Limit
		(dBm/MHz)	Total (dBm/MHz)	Total (dBm/500kHz)	B1-B3 (dBm/MHz) B4 (dBm/500kHz)
802.11a	5180	4.30	4.30	-	11.00
	5200	3.69	3.69	-	11.00
	5240	4.04	4.04	-	11.00
	5745	5.86	5.86	2.85	30.00
	5785	5.04	5.04	2.03	30.00
	5825	5.25	5.25	2.24	30.00
802.11ac VHT20	5180	3.60	3.60	-	11.00
	5200	3.72	3.72	-	11.00
	5240	3.65	3.65	-	11.00
	5745	5.65	5.65	2.64	30.00
	5785	4.66	4.66	1.65	30.00
	5825	4.83	4.83	1.82	30.00
802.11ac VHT40	5190	1.02	1.02	-	11.00
	5230	0.49	0.49	-	11.00
	5755	2.17	2.17	-0.84	30.00
	5795	2.35	2.35	-0.66	30.00
802.11ac VHT80	5210	-3.17	-3.17	-	11.00
	5775	-10.78	-10.78	-13.79	30.00

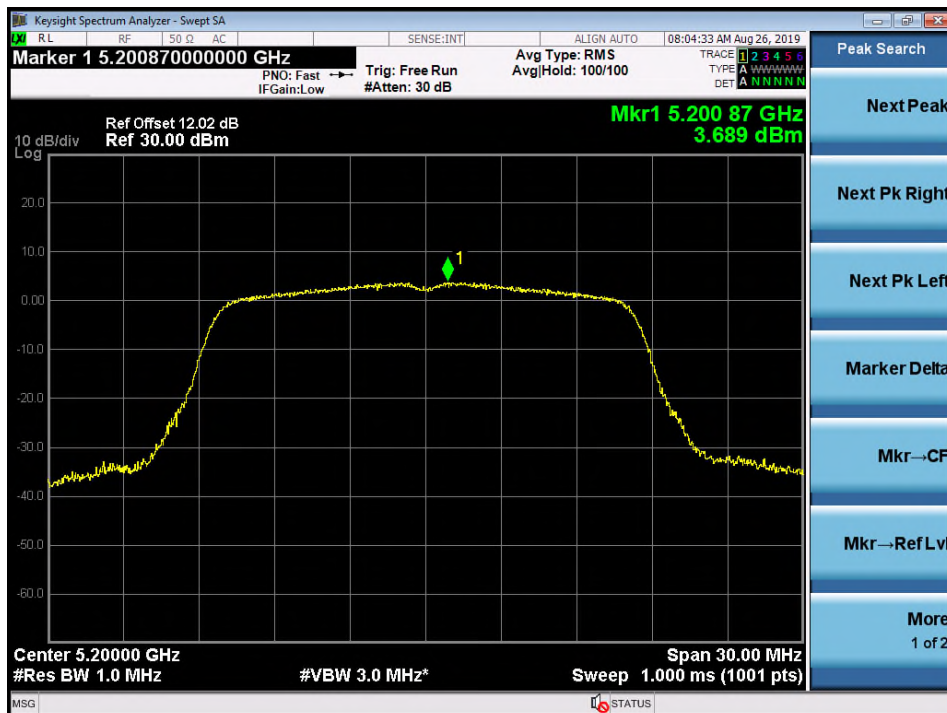
The formula dBm/MHz and dBm/500kHz is converted equal to Total (dBm/MHz)+10log(500kHz/1MHz).

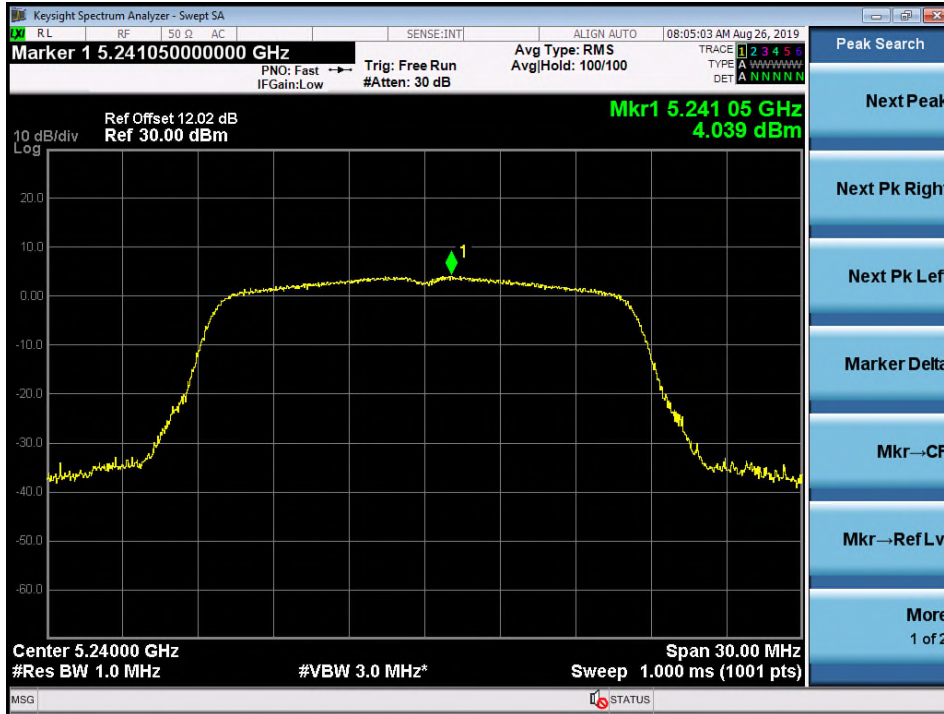
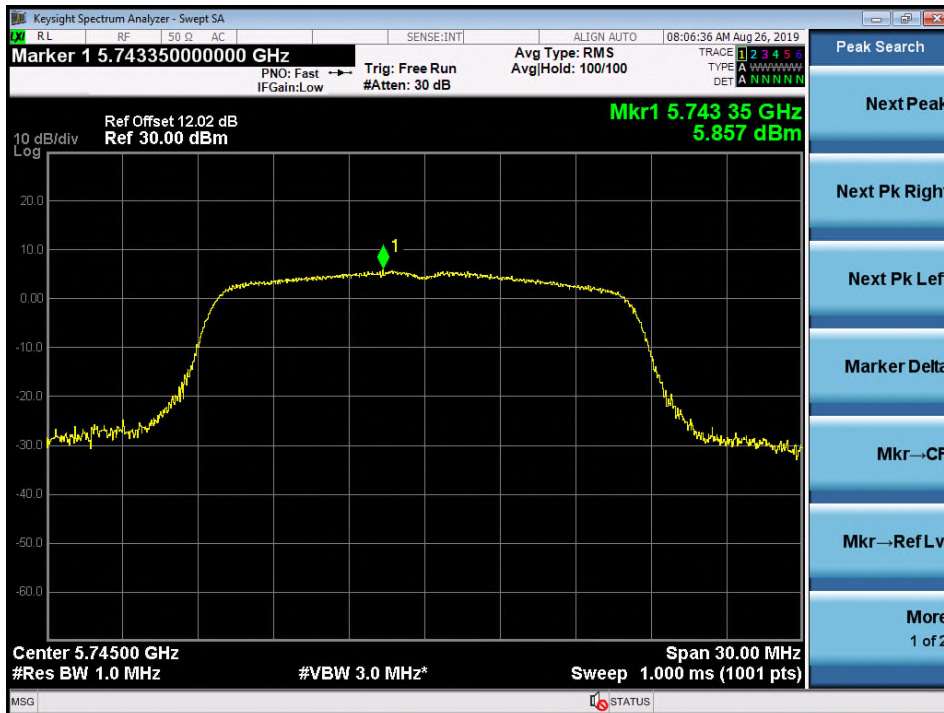
Test Plot of FCC Power Density

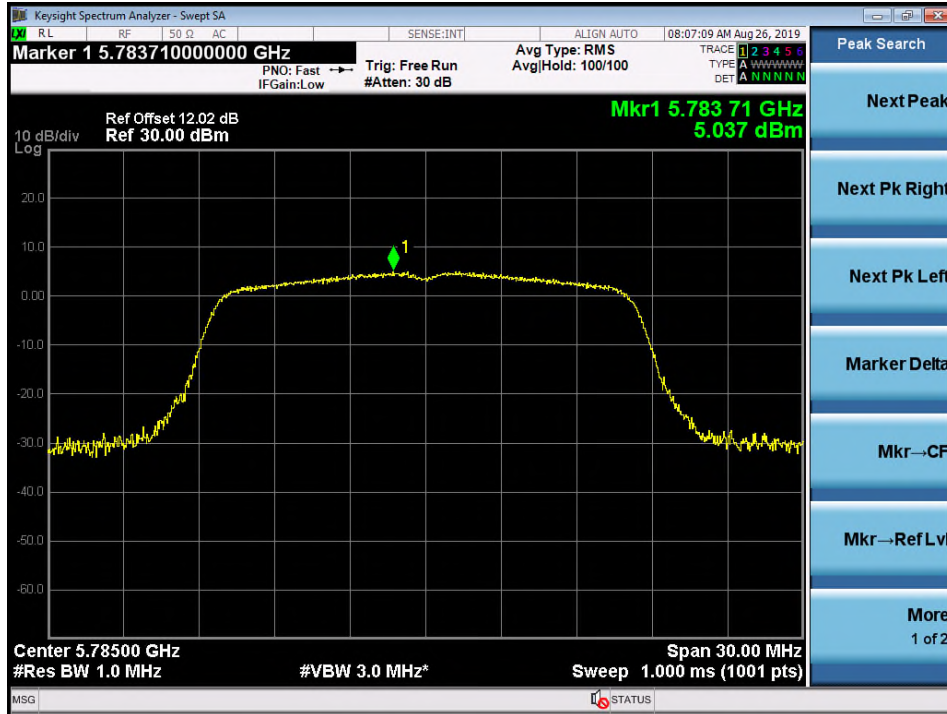
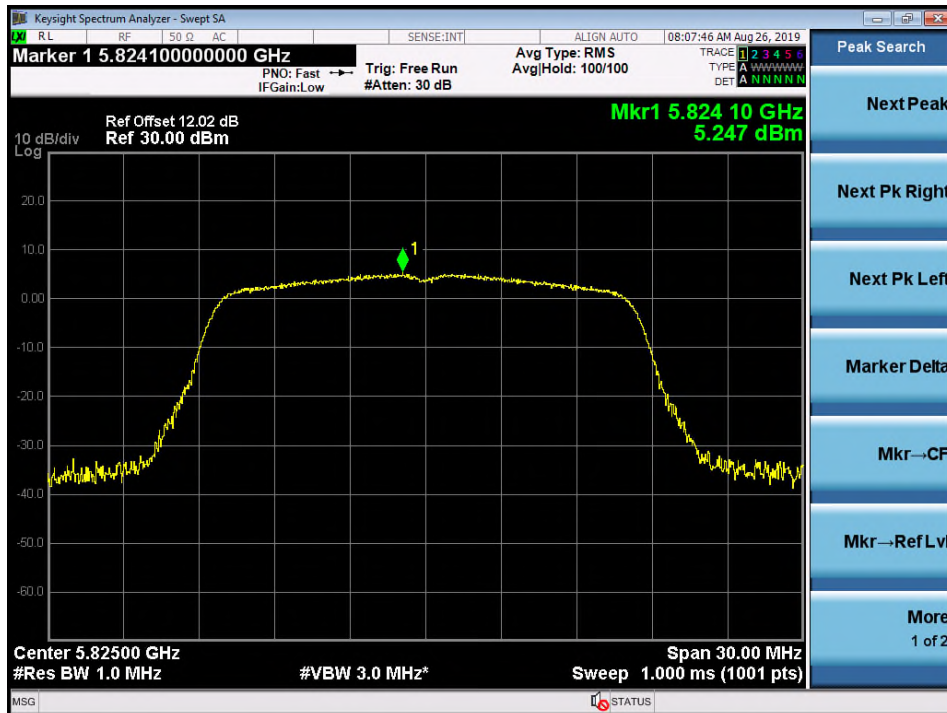
802.11a 5180MHz

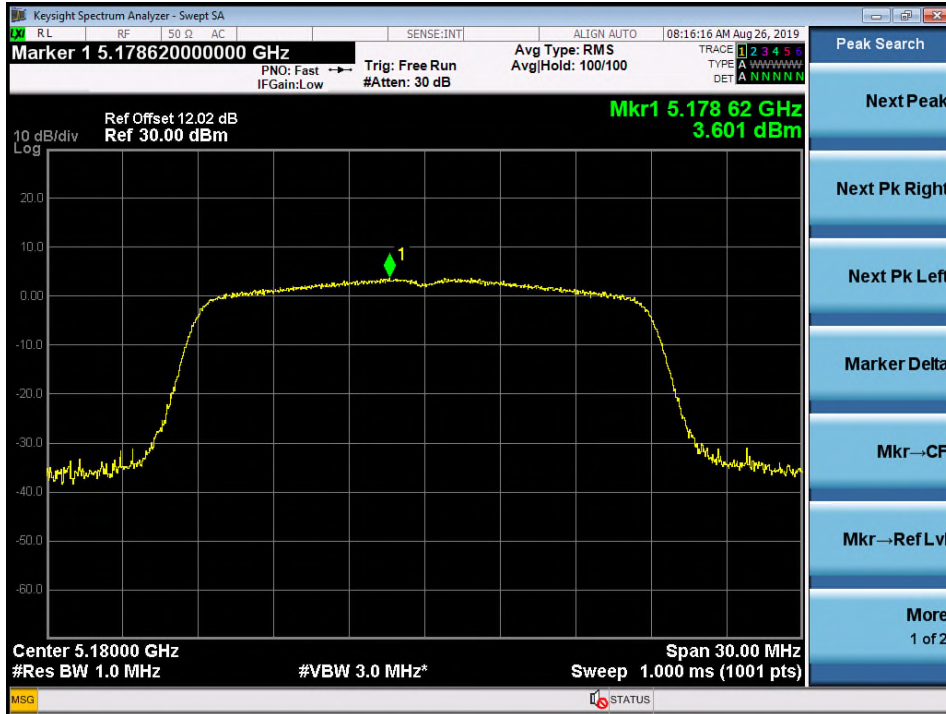
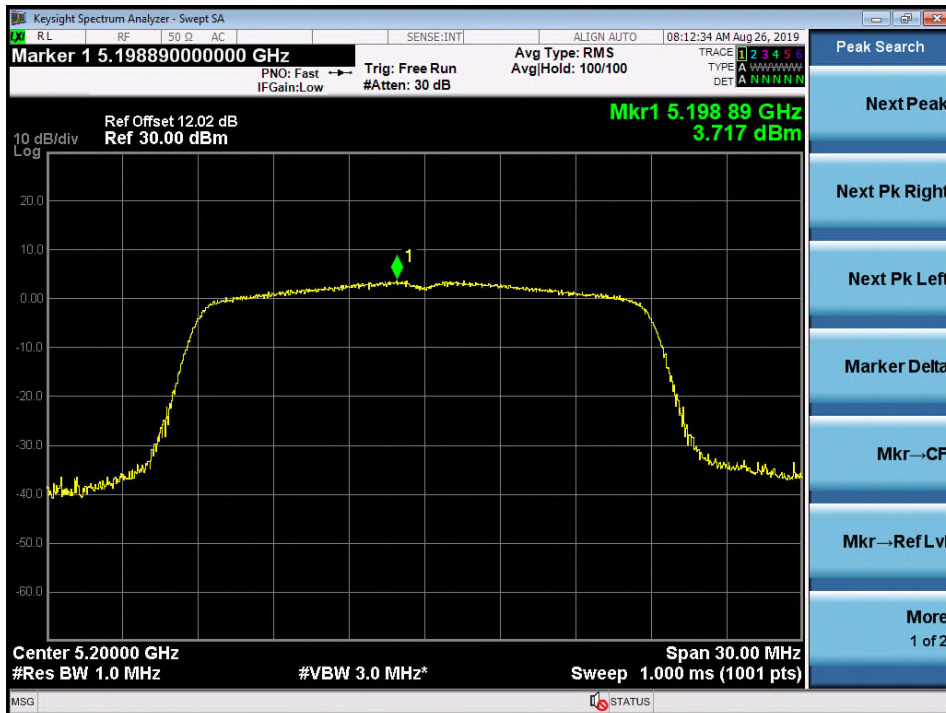


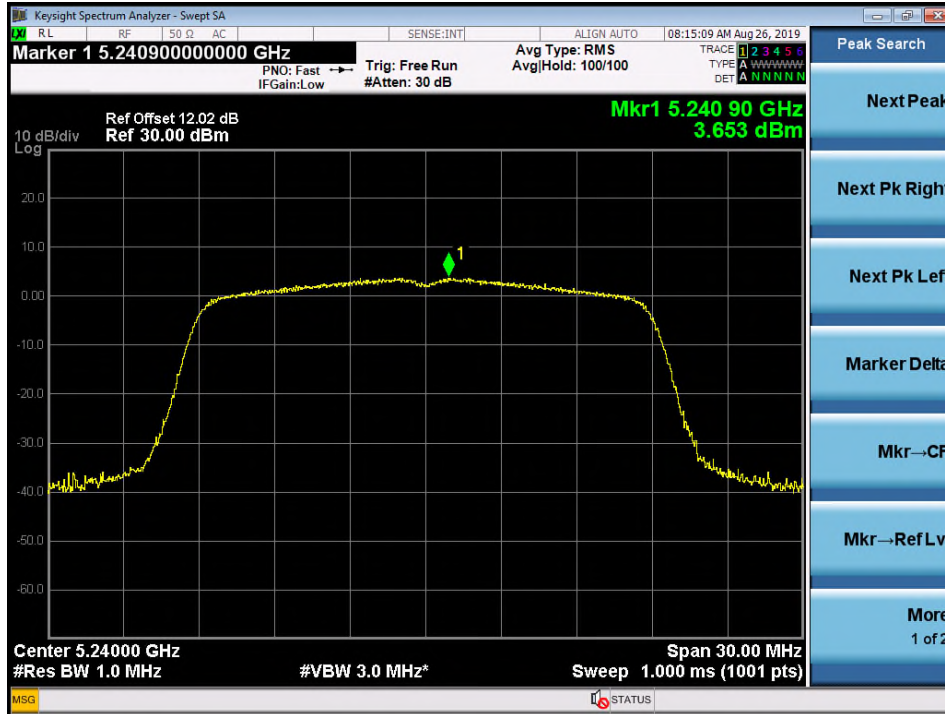
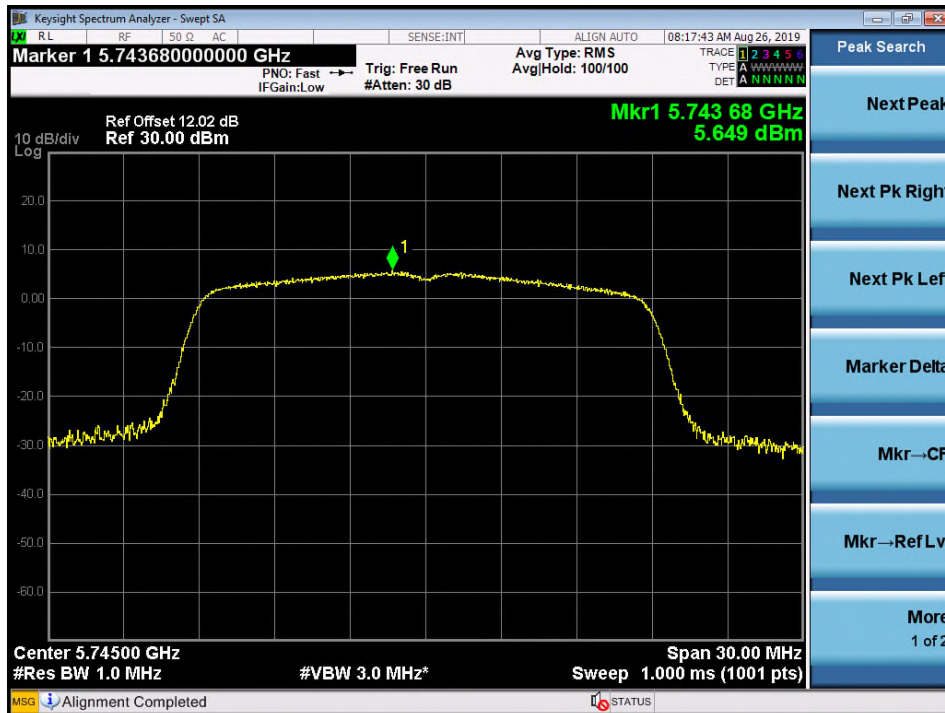
802.11a 5200MHz

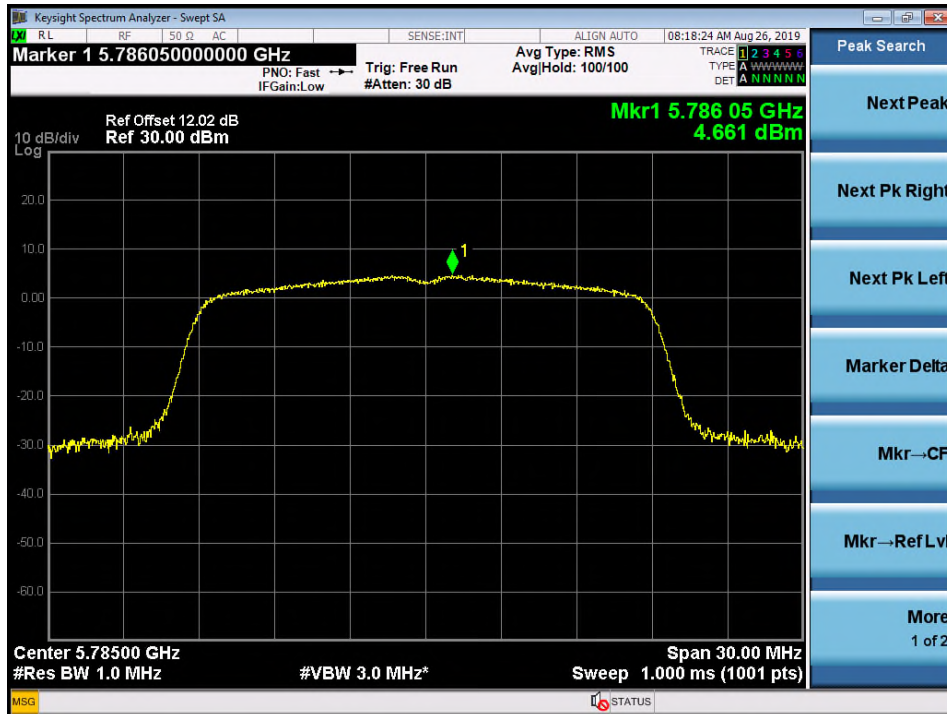
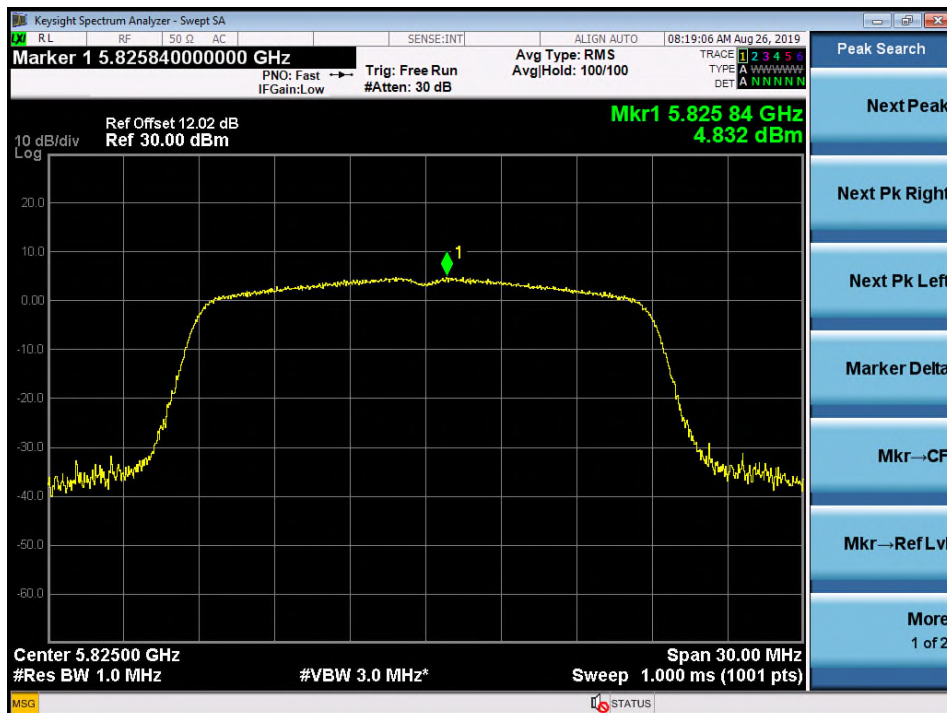


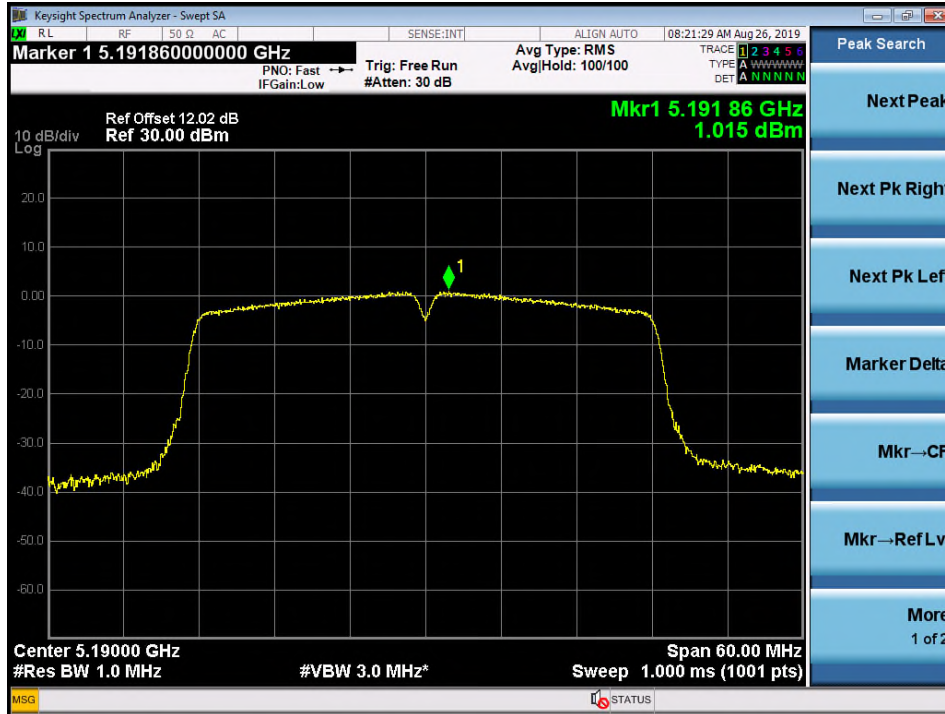
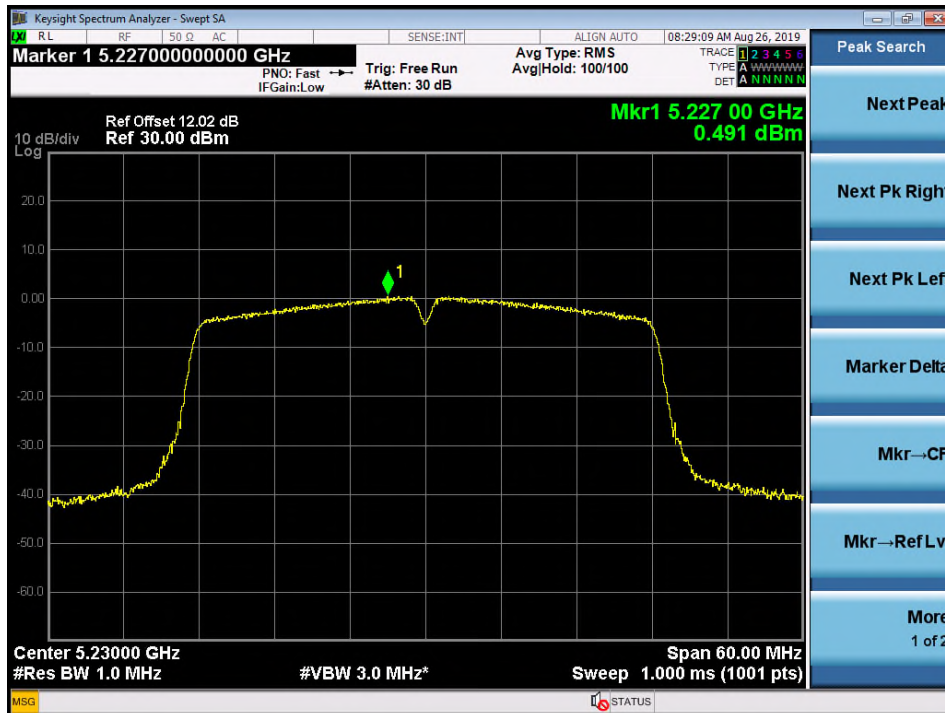
802.11a 5240MHz

802.11a 5745MHz


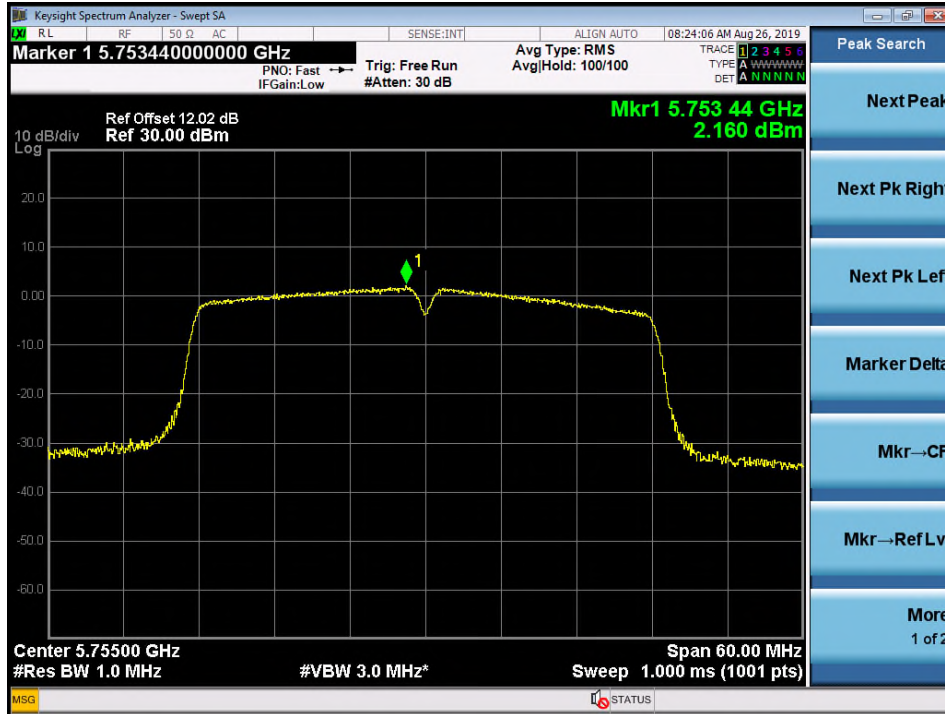
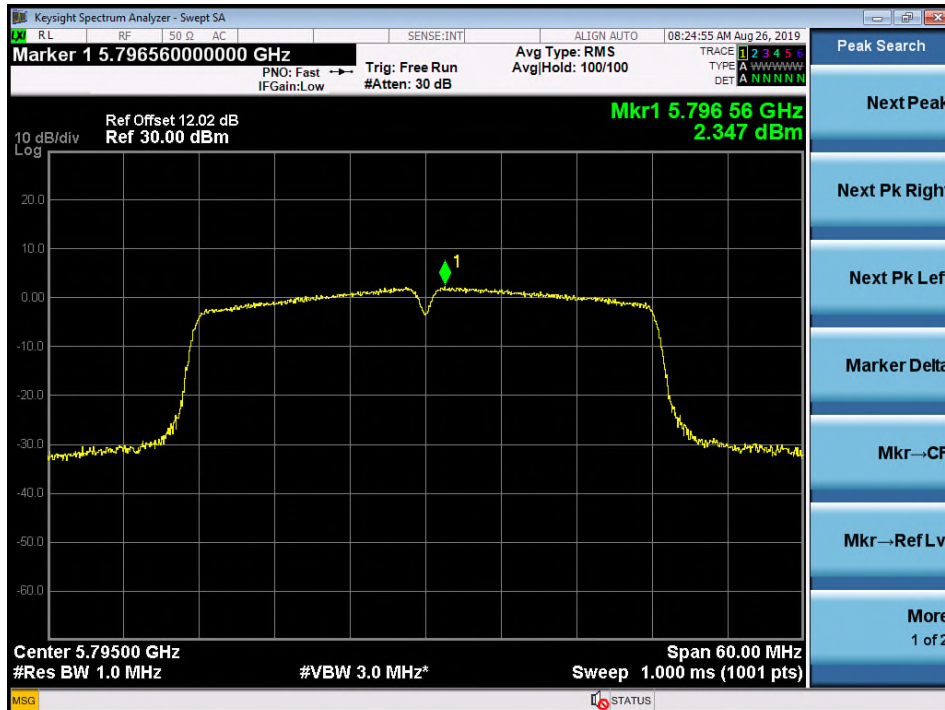
802.11a 5785MHz

802.11a 5825MHz


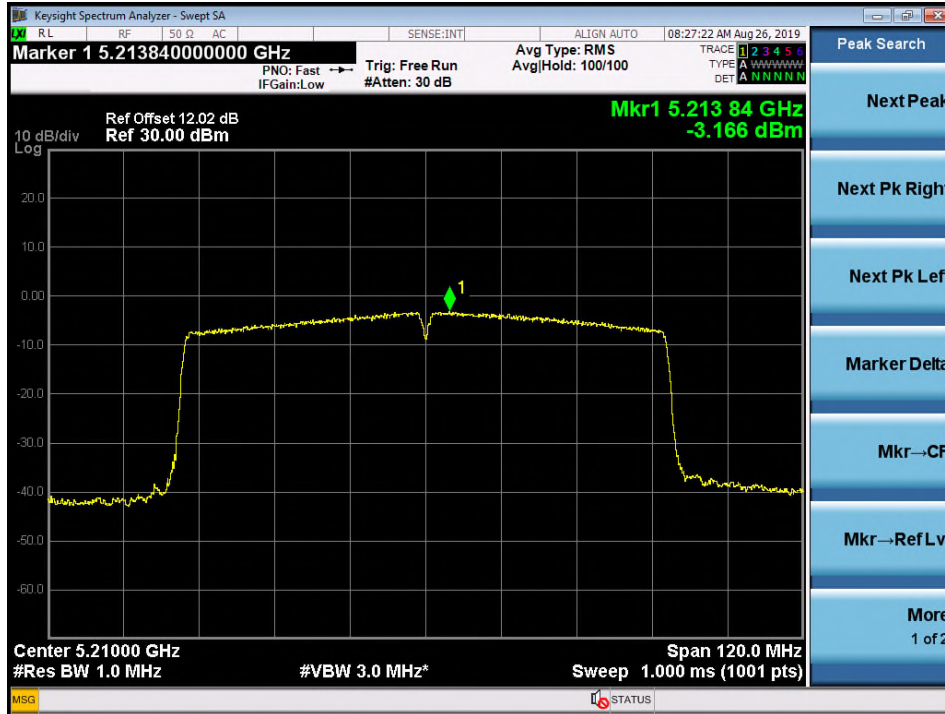
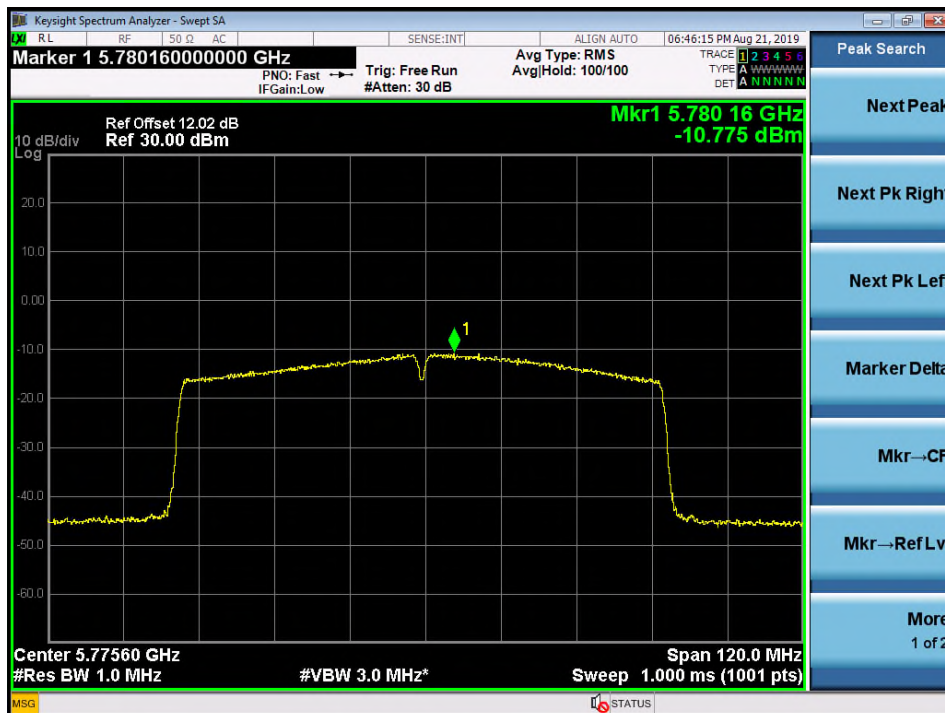
802.11ac VHT20 5180MHz

802.11ac VHT20 5200MHz


802.11ac VHT20 5240MHz

802.11ac VHT20 5745MHz


802.11ac VHT20 5785MHz

802.11ac VHT20 5825MHz


802.11ac VHT40 5190MHz

802.11ac VHT40 5230MHz


802.11ac VHT40 5755MHz

802.11ac VHT40 5795MHz


802.11ac VHT80 5210MHz

802.11ac VHT80 5775MHz


5.1.7 Frequency Stability Measurement

RESULT:
Passed

Test standard : FCC 15.407(g)
 Basic standard : ANSI C63.10: 2013
 Limits : ±20ppm
 Kind of test site : Shielded room

Test setup

Test Bandwidth : 20/40/80MHz
 Operation mode : A

Table 13: Test result of Frequency Stability

Bandwidth 20M

Voltage	Measurement Frequency (MHz)	
(V)	5200	5785
126.5	5199.9877	5784.9873
110	5199.9869	5784.9869
93.5	5199.9867	5784.9862

Max. Deviation (ppm)	2.56	2.39
Result	Pass	

Temperature	Measurement Frequency (MHz)	
(°C)	5200	5785
-20	5199.9804	5784.9844
-10	5199.9814	5784.9856
0	5199.9832	5784.9867
10	5199.9849	5784.9868
20	5199.9869	5784.9869
30	5199.9912	5784.9912
40	5199.9923	5784.9929
50	5199.9929	5784.9949

Max. Deviation (ppm)	3.77	2.70
Result	Pass	

Prüfbericht - Nr.: 50278819 001
Test Report No.
Seite 51 von 58
Page 51 of 58
Bandwidth 40M

Voltage	Measurement Frequency (MHz)	
(V)	5190	5755
126.5	5189.9870	5754.9873
110	5189.9869	5754.9869
93.5	5189.9862	5754.9866

Max. Deviation (ppm)	2.66	2.33
Result	Pass	

Temperature	Measurement Frequency (MHz)	
(°C)	5190	5755
-20	5189.9810	5754.9838
-10	5189.9824	5754.9847
0	5189.9841	5754.9854
10	5189.9861	5754.9860
20	5189.9869	5754.9869
30	5189.9912	5754.9912
40	5189.9929	5754.9931
50	5189.9947	5754.9937

Max. Deviation (ppm)	3.66	2.81
Result	Pass	

Bandwidth 80M

Voltage	Measurement Frequency (MHz)	
(V)	5210	5775
126.5	5209.9878	5774.9877
110	5209.9869	5774.9869
93.5	5209.9863	5774.9865

Max. Deviation (ppm)	2.63	2.34
Result	Pass	

Temperature	Measurement Frequency (MHz)	
(°C)	5210	5775
-20	5209.9834	5774.9826
-10	5209.9838	5774.9831
0	5209.9841	5774.9850
10	5209.9853	5774.9861
20	5209.9869	5774.9869
30	5209.9912	5774.9912
40	5209.9914	5774.9919
50	5209.9925	5774.9920

Max. Deviation (ppm)	3.19	3.01
Result	Pass	

5.1.8 Spurious Emission

RESULT:**Passed**

Test standard : FCC 15.205, FCC 15.209, FCC15.407

Basic standard : ANSI C63.10: 2013

Limits : Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a) and RSS-Gen i5, 8.10 (Table 7), must comply with the radiated emission limits specified in FCC 15.209(a) and RSS-Gen i5, 8.9 (Table 5 and 6).

Emission radiated outside the restricted and authorized frequency bands must either comply with the radiated emission limits specified for the restricted bands or in FCC15.407 and RSS-247 i2, 6.2

Kind of test site : 3m Semi-Anechoic Chamber

Test setup

Test Channel : Refer to Appendix D

Operation mode : A

Ambient temperature : 20-24 °C

Relative humidity : 50-65 %

Atmospheric pressure : 100-103 kPa

Factor (dB/m)=Antenna Factor(dB/m)+Cable loss (dB)

Level(dBuV/m)=Reading(dBuV)+ Factor(dB/m)

Testing was carried out within frequency range 9kHz to the tenth harmonic. For details refer to Appendix D. The Radiated Emissions testing was performed in the X, Y and Z axis orientation. The worst-case Axis orientation is recorded in this test report.

5.2 Mains Emissions

5.2.1 Mains Conducted Emissions

RESULT:**Passed**

Test standard : FCC Part 15.207
FCC Part 15.107

Limits : Mains Conducted emissions as defined in
above test standards must comply with the
mains conducted emission limits specified

Kind of test site : Shielded Room

Test setup

Operation mode : C

Ambient temperature : 20-24°C

Relative humidity : 50-65%

Atmospheric pressure : 100-103 kPa

Factor (dB/m)=Antenna Factor(dB/m)+Cable loss (dB)

Level(dBuV/m)=Reading(dBuV)+ Factor(dB/m)

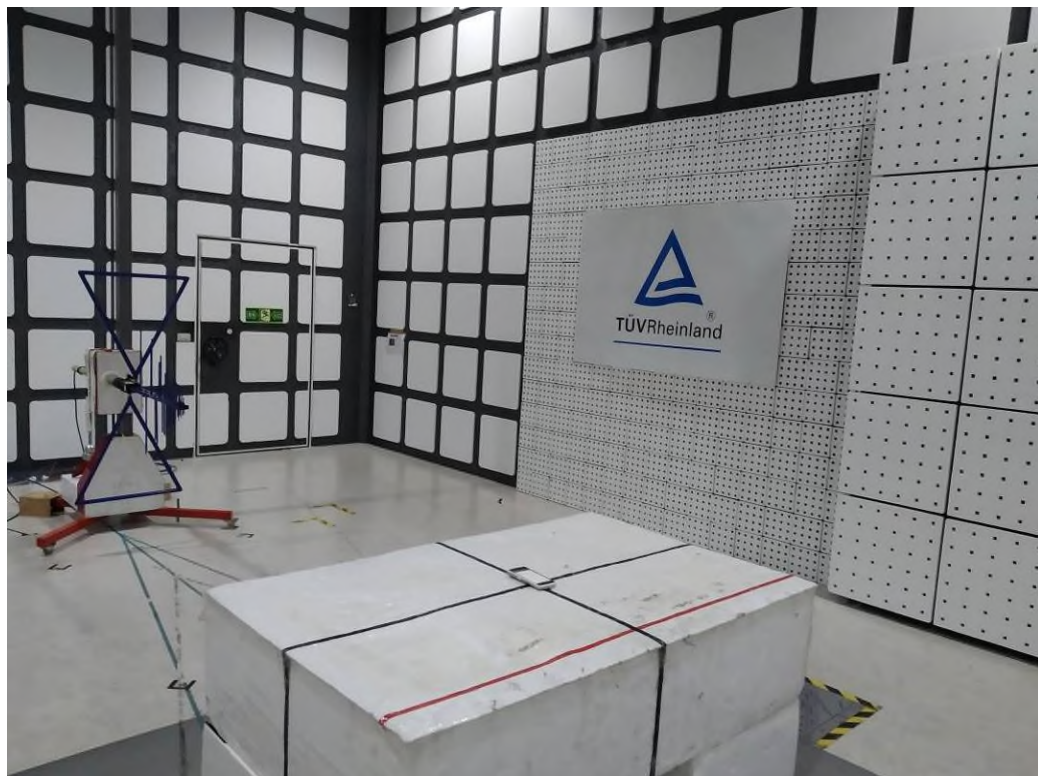
Remark: For details refer to Appendix D.

6. Photographs of the Test Set-Up

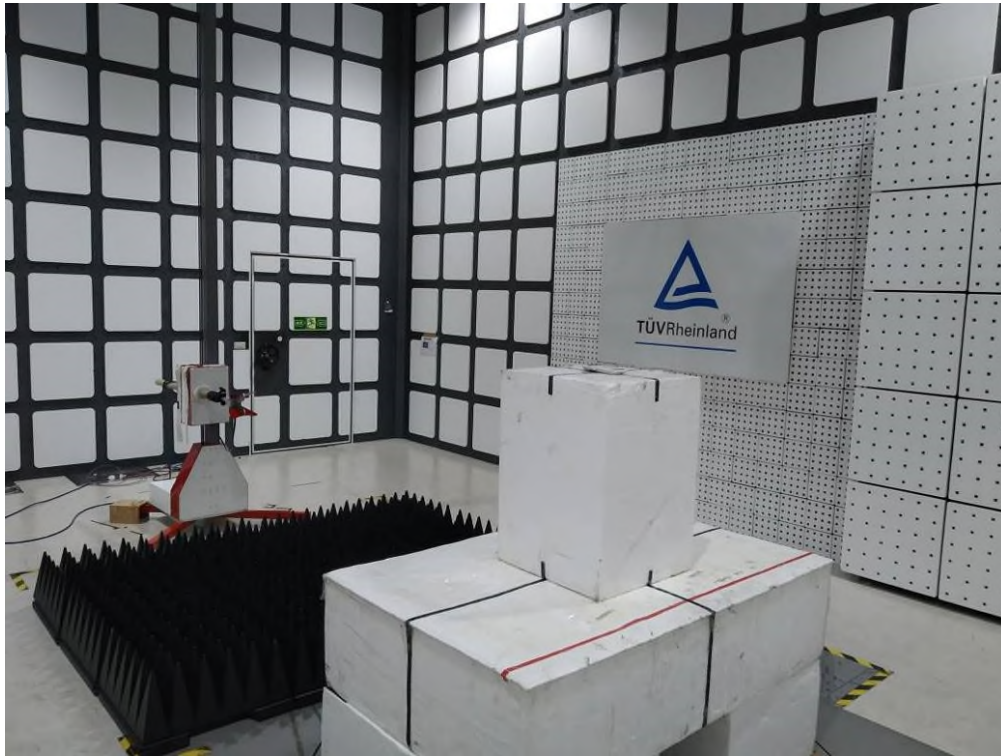
Photograph 1: Set-up for Spurious Emissions (Front View)



Photograph 2: Set-up for Spurious Emissions (Back View 1)



Photograph 3: Set-up for Spurious Emissions (Back View 2)



Photograph 4: Set-up for Conducted testing



Photograph 5: Set-up for AC Mains (Front)



Photograph 6: Set-up for AC Mains (Back)



7. List of Tables

Table 1: Applied Standard and Test Levels	5
Table 2: List of Test and Measurement Equipment	7
Table 3: Emission Measurement Uncertainty.....	8
Table 4: Basic Information of EUT	9
Table 5: Technical Specification of EUT	9
Table 6: Channel Frequency Table	10
Table 7: Table for Parameters of Test Software Setting	12
Table 8: Test result of Duty Cycle	17
Table 9: FCC Test result of Average Output Power.....	21
Table 11: Test result of 26dB & 99% Bandwidth.....	22
Table 12: Test result of 6dB Bandwidth	32
Table 13: Test result of FCC Power Density	40
Table 15: Test result of Frequency Stability	50

8. List of Photographs

Photograph 1: Set-up for Spurious Emissions (Front View).....	55
Photograph 2: Set-up for Spurious Emissions (Back View 1)	55
Photograph 3: Set-up for Spurious Emissions (Back View 2)	56
Photograph 4: Set-up for Conducted testing	56
Photograph 5: Set-up for AC Mains (Front).....	57
Photograph 6: Set-up for AC Mains (Back)	57