



REPORT No.: SZ23010190W04

TEST REPORT

APPLICANT : LogicMark, Inc.

PRODUCT NAME : Connected Personal Emergency
Response System (PERS) device.

MODEL NAME : 60911, 60711

BRAND NAME : LogicMark

FCC ID : TYD-FA60911

STANDARD(S) : 47 CFR Part 15 Subpart E

RECEIPT DATE : 2023-02-02

TEST DATE : 2023-02-07 to 2023-02-19

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Change History		
Version	Date	Reason for change
1.0	2023-07-21	First edition

1. Summary of Test Result

No.	Section	Description	Test Date	Test Engineer	Result	Method Determination /Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	No deviation
2	ANSI C63.10	Duty Cycle of the Test Signal	Feb. 10, 2023	He Yuyang	PASS	No deviation
3	15.407(a)	Maximum Conducted Output Power	Feb. 10, 2023	He Yuyang	PASS	No deviation
4	15.407(a) (e)	Emission Bandwidth	Feb. 12, 2023	He Yuyang	PASS	No deviation
5	15.407(a)	Peak Power Spectral Density	Feb. 12, 2023	He Yuyang	PASS	No deviation
6	15.407(g)	Frequency Stability	Feb. 12, 2023	He Yuyang	PASS	No deviation
7	15.207	Conducted Emission	Feb. 19, 2023	Wu Zhaoling	PASS	No deviation
8	15.407(b)	Restricted Frequency Bands	Feb. 18, 2023	Gao Jianrou	PASS	No deviation
9	15.407(b)	Radiated Emission	Feb. 19, 2023	Gao Jianrou	PASS	No deviation

Note 1: The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.102013.

Note 2: These RF tests were performed according to the method of measurements prescribed in KDB789033 D02 v02r01.

Note 3: These RF tests were performed according to the method of measurements prescribed in KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02.

Note 4: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 5: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.



1.1. Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 15 Subpart E Radio Frequency Devices



1.2. Test Equipment List

1.2.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
EXA Signal Analyzer	MY53470836	N9010A	Agilent	2023.02.27	2024.02.26
USB Wideband Power Sensor	MY54180008	U2021XA	Agilent	2022.10.11	2023.10.10
Temperature Chamber	12108015	DTL-003S 101	YOMA	2022.10.10	2023.10.09
RF Cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial Cable	CB02	RF02	Morlab	N/A	N/A
SMA Connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

1.2.2 Conducted Emission Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY56400093	N9038A	KEYSIGHT	2023.02.09	2024.02.08
LISN	8127449	NSLK 8127	Schwarzbeck	2023.02.21	2024.02.20
Pulse Limiter (10dB)	VTSD 9561 F-B #206	VTSD 9561-F	Schwarzbeck	2022.07.06	2023.07.05
RF Coaxial Cable (DC-100MHz)	BNC	MRE04	Qualwave	2022.07.08	2023.07.07

1.2.3 List of Software Used

Description	Manufacturer	Software Version
Test System	MaiWei	2.0.0.0
Morlab EMC R V1.2	Morlab	V1.0
TS+ -[JS32-CE]	Tonscend	V2.5.0.0

**1.2.4 Radiated Test Equipments**

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY54130016	N9038A	Agilent	2022.07.06	2023.07.05
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2022.05.25	2025.05.24
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2022.02.11	2025.02.10
Test Antenna – Horn	01774	BBHA 9120D	Schwarzbeck	2022.07.13	2025.07.12
Test Antenna – Horn	BBHA9170 #773	BBHA9170	Schwarzbeck	2022.07.14	2025.07.13
Preamplifier (10MHz-6GHz)	46732	S10M100L38 02	LUCIX CORP.	2022.07.08	2023.07.07
Preamplifier (2GHz-18GHz)	61171/61172	S020180L32 03	LUCIX CORP.	2022.07.08	2023.07.07
Preamplifier (18GHz-40GHz)	DS77209	DCLNA0118-40C-S	Decentest	2022.07.23	2023.07.22
RF Coaxial Cable (DC-18GHz)	MRE001	PE330	Pasternack	2022.07.08	2023.07.07
RF Coaxial Cable (DC-18GHz)	MRE002	CLU18	Pasternack	2022.07.08	2023.07.07
RF Coaxial Cable (DC-18GHz)	MRE003	CLU18	Pasternack	2022.07.08	2023.07.07
RF Coaxial Cable (DC-40GHz)	22290045	QA360-40-K K-0.5	Qualwave	2022.07.08	2023.07.07
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40-K KF-2	Qualwave	2022.07.08	2023.07.07
RF Coaxial Cable (DC-18GHz)	22120181	QA500-18-N N-5	Qualwave	2022.07.08	2023.07.07
Notch Filter	N/A	WRCG-5150-5350	Wainwright	2022.07.08	2023.07.07
Notch Filter	N/A	WRCG-5725-5850	Wainwright	2022.07.08	2023.07.07
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.05.10	2025.05.09



1.3. Measurement Uncertainty

Test Items	Uncertainty	Remark
Peak Output Power	$\pm 2.22\text{dB}$	Confidence levels of 95%
Power Spectral Density	$\pm 2.22\text{dB}$	Confidence levels of 95%
Bandwidth	$\pm 5\%$	Confidence levels of 95%
Restricted Frequency Bands	$\pm 5\%$	Confidence levels of 95%
Radiated Emission	$\pm 2.95\text{dB}$	Confidence levels of 95%
Conducted Emission	$\pm 2.44\text{dB}$	Confidence levels of 95%

1.4. Testing Laboratory

Laboratory Name	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone	+86 755 36698555
Facsimile	+86 755 36698525
FCC Designation Number	CN1192
FCC Test Firm Registration Number	226174



2. General Description

2.1. Information of Applicant and Manufacturer

Applicant	LogicMark, Inc.
Applicant Address	2801 Diode Lane, Louisville, KY 40299 United States
Manufacturer	Skymax Electronics Company Limited
Manufacturer Address	Rm. 9, 12/F, Grandtech Centre, 8 On Ping Street, Shatin, N.T., Hong kong

2.2. Information of EUT

Product Name:	Connected Personal Emergency Response System (PERS) device.	
Sample No.:	1#	
Hardware Version:	V1.0	
Software Version:	V1.0	
Modulation Technology:	OFDM	
Modulation Mode:	802.11a, 802.11n (HT20), 802.11n (HT40)	
Operating Frequency Range:	5180MHz-5240MHz; 5745MHz-5825MHz	
Antenna Type:	Dipole Antenna	
Antenna Gain:	2.0dBi	
Accessory Information:	Battery 1	
	Brand Name:	Wifi PERS_SD752540PE
	Model No.:	XDRDG218001
	Serial No.:	N/A
	Capacity:	1070mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.4V
	Manufacturer:	ZHUHAI SUNDA TECHNOLOGY CO.,LTD



Accessory Information:	Battery 2	
	Brand Name:	Great Power
	Model No.:	GSP752540HV
	Serial No.:	N/A
	Capacity:	1000mAh
	Rated Voltage:	3.83V
	Charge Limit:	4.4V
	Manufacturer:	ZHUHAI GREAT POWER ENERGY CO., LTD.
	Adaptor	
	Brand Name:	N/A
	Model No.:	AS0601A-0501000USU
	Serial No.:	N/A
	Rated Output:	5V $\overline{\text{---}}$ 1A
	Rated Input:	100-240V $\sim$ 50/60Hz, 0.2A
	Manufacturer:	SHENZHEN FUSHIGANG TECHNOLOGY CO., LTD.

Note 1: According to the certificate holder, they declared that the models 60911 and 60711, only the models are different, they have the same hardware and software. In addition to the differences described above, the others are the same. No other changes, all RF parameters remain the same as before. The main measuring model is 60911, only the results for 60911 were recorded in this report.

Note 2: We use the dedicated software to control the EUT continuous transmission.

Note 3: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



2.3.Channel List of EUT

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

Note 1: The black bold channels were selected for test.

2.4. Test Configuration of EUT

2.4.1. Modulation Type and Data Rate of EUT

Mode	Bandwidth (MHz)	Modulation Technology	Modulation Type	Data Rate	RU Size
802.11a	20	OFDM	DBPSK	1/2/5.5/11Mbps	N/A
			DQPSK		
			CCK		
802.11n	20/40 (HT20/40)	OFDM	BPSK	MCS0~MCS7	N/A
			QPSK		
			16QAM		
			64QAM		

Note1: The worst-case mode (bold face) in all data rates has been determined during the pre-scan, only the test data of the worst-case were recorded in this report.

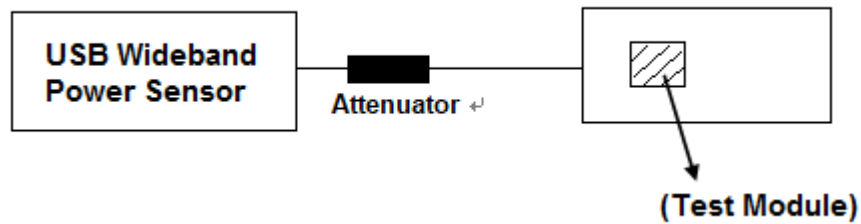
2.5. Test Conditions

Temperature (°C)	15-35
Relative Humidity (%)	30-60
Atmospheric Pressure (kPa)	86-106

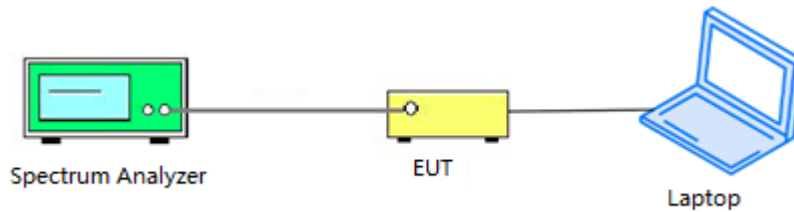
2.6. Test Setup Layout Diagram

2.6.1. Conducted Measurement

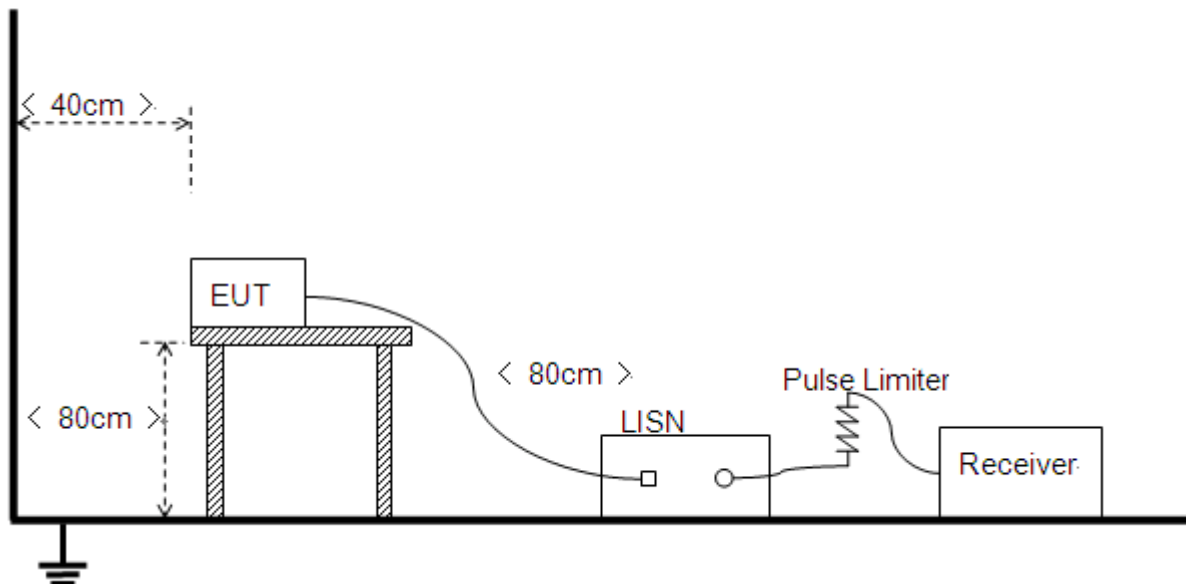
For power item that BW below 80MHz system:



For power item that BW equal or above 80MHz and other items:

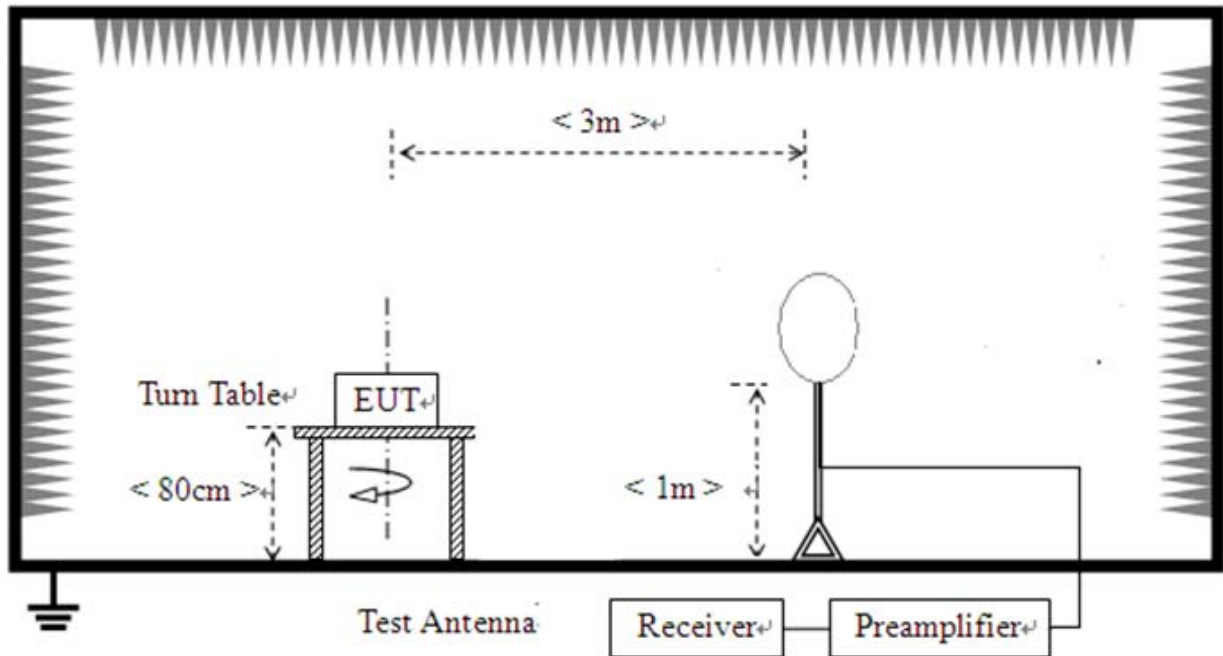


2.6.2. Conducted Emission Measurement

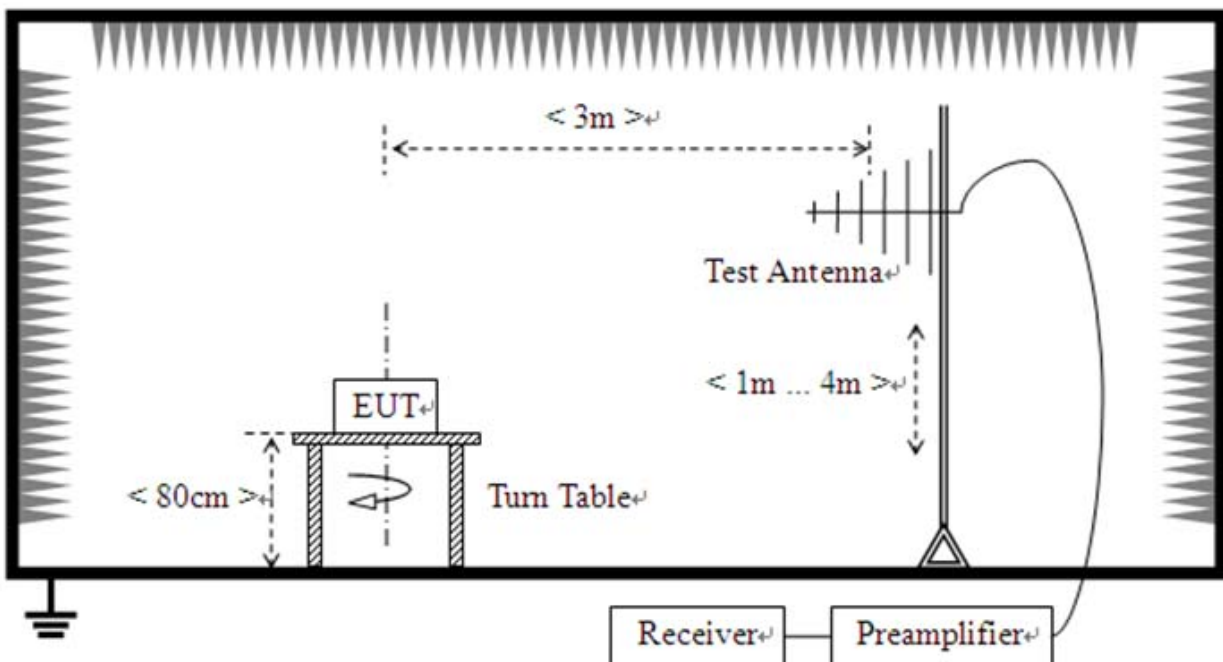


2.6.3.Radiation Measurement

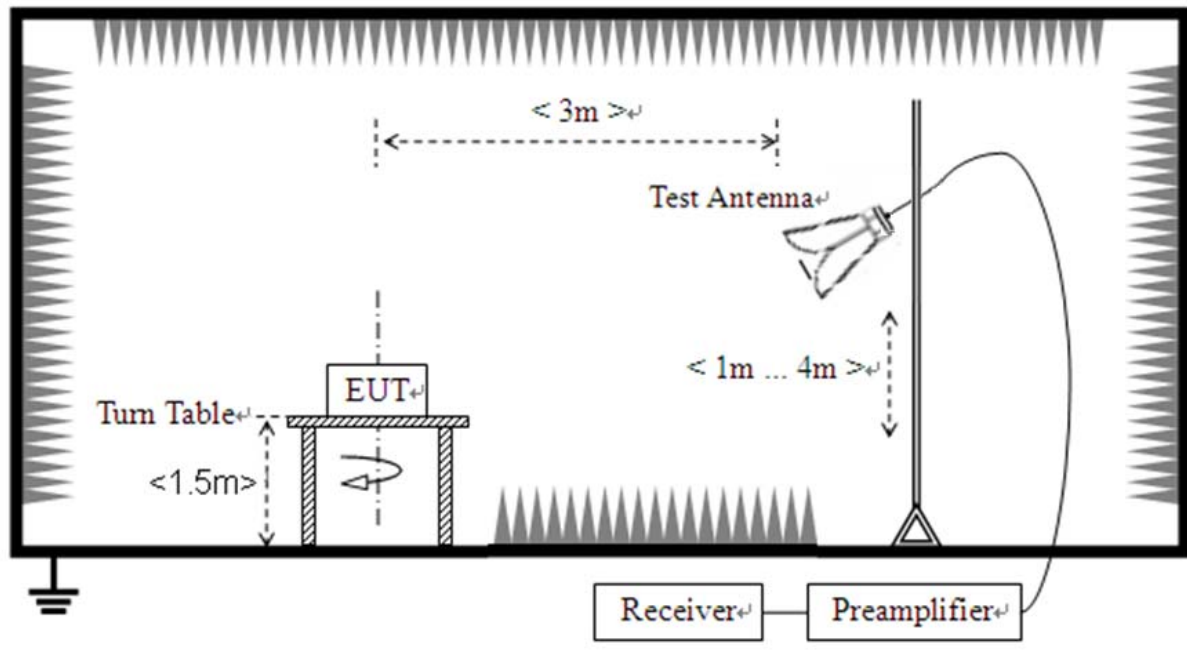
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz





3. Test Results

3.1. Antenna Requirement

3.1.1. Requirement

According to FCC 15.203, 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 shall be considered sufficient to comply with the provisions of this section.

3.1.2. Test Result

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

3.2. Duty Cycle of Test Signal

3.2.1. Requirement

Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%). When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be used to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration (T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data are being acquired (i.e., no transmitter OFF-time is to be considered).

When continuous transmission cannot be achieved and sweep triggering/signal gating cannot be implemented, alternative procedures are provided that can be used to measure the average power; however, they will require an additional measurement of the transmitter duty cycle (D). Within this sub clause, the duty cycle refers to the fraction of time over which the transmitter is ON and is transmitting at its maximum power control level. The duty cycle is considered to be constant if variations are less than $\pm 2\%$; otherwise, the duty cycle is considered to be non constant.

3.2.2. Test Result

Refer to Annex A.1 in this report.

3.3. Maximum Conducted Output Power

3.3.1. Requirement

(1) 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 250mW provided the maximum antenna gain does not exceed 6dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or $11\text{dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

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

If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

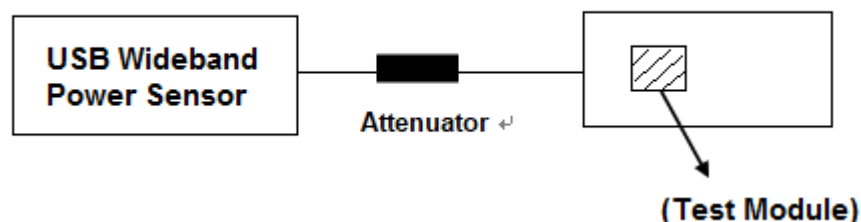
(4) According to KDB662911D01 Measure-and-sum technique, the conducted emission level (e.g., transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in units that are directly proportional to power.

(5) According to KDB 662911 D01, the directional gain = $G_{\text{ANT}} + 10\log(N_{\text{ANT}})\text{dBi}$, where G_{ANT} is the antenna gain in dBi, N_{ANT} is the number of outputs.

3.3.2. Test Procedures

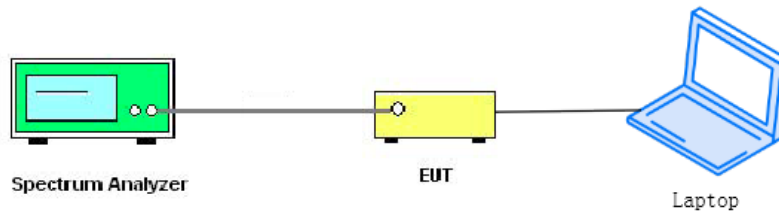
Section E) 3) of KDB 789033 defines a methodology using a USB Wideband Power Sensor.

Test Setup:



The EUT (Equipment under the test) which is coupled to the USB Wideband Power Sensor; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in USB Wideband Power Sensor.

For ac (VHT80) mode power



The EUT (Equipment under the test) is coupled to the Spectrum analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in Spectrum analyzer.

3.3.3.Test Result

Refer to Annex A.2 in this report.

3.4. Emission Bandwidth

3.4.1. Requirement

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. Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

3.4.1. Test Procedures

1. KDB 789033 Section C) 1) Emission Bandwidth was used in order to prove compliance
 - a) Set RBW = approximately 1% of the emission bandwidth.
 - b) Set VBW > RBW.
 - c) Detector = Peak.
 - d) Trace mode = max hold.
 - e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
2. KDB 789033 Section C) 2) minimum emission bandwidth for the band 5.725-5.85GHz was used in order to prove compliance.

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

 - a) Set RBW = 100 kHz.
 - b) Set video bandwidth (VBW) $\geq 3 \times$ RBW.
 - c) Detector = Peak.
 - d) Trace mode = max hold.
 - e) Sweep = auto couple.
 - f) Allow the trace to stabilize.
 - g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



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3.4.2.Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.4.3.Test Result

Refer to Annex A.3 in this report.

3.5. Peak Power Spectral Density

3.5.1. Requirement

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

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band.

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

If transmitting antennas of directional gain greater than 6dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(4) According to KDB662911D01 Measure-and-sum technique, the conducted emission level (e.g., transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in units that are directly proportional to power.

(5) According to KDB 662911 D01, the directional gain = $G_{ANT} + 10\log(N_{ANT})$ dBi, where G_{ANT} is the antenna gain in dBi, N_{ANT} is the number of outputs.

3.5.2. Test Procedures

KDB 789033 Section F) Maximum Power Spectral Density (PSD) Method SA-3 was used in order to prove compliance

- 1) Set span to encompass the entire 26-dB emission bandwidth
- 2) Set RBW = 1MHz. Set VBW $\geq$ 3MHz
- 3) Number of points in sweep $\geq$ 2 Span / RBW. Sweep time = auto
- 4) Detector = Average
- 5) Trace mode=Max hold

Record the max value

3.5.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.5.4. Test Result

Refer to Annex A.4 in this report.



3.6. Frequency Stability

3.6.1. Requirement

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

3.6.2. Test Procedures

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between 5°C to 40°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

3.6.3. Test Result

Refer to Annex A.5 in this report.

3.7. Conducted Emission

3.7.1. Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

Frequency Range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

Note:

- (a) The lower limit shall apply at the band edges.
- (b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.7.2. Test Procedures

The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10: 2013.

3.7.3. Test Setup Layout

Refer to chapter 2.6.2 in this report.

3.7.4. Test Result

Refer to Annex A.7 in this report.

3.8. Restricted Frequency Bands

3.8.1. Requirement

The peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of -27dBm/MHz.
- (2) For transmitters operating in the 5.25–5.35 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of -27dBm/MHz.
- (3) For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of -27dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - (i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

The following formula is used to convert the equipment isotropic radiated power(e.i.r.p.) to field strength (dBμV/m);

$$E = 1000000 \times \sqrt{30P} / 3 \mu\text{V/m}$$

where P is the EIRP in Watts

Therefore: -27 dBm/MHz = 68.23 dBuV/m



Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table).

3.8.2.Test Procedures

The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

KDB 789033 Section H) 3)5)6(d)) was used in order to prove compliance

For the Test Antenna:

Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

3.8.3.Test Setup Layout

Refer to chapter 2.6.3 in this report.

3.8.4.Test Result

Refer to Annex A.8 in this report.

3.9. Radiated Emission

3.9.1. Requirement

The peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of -27dBm/MHz.
- (2) For transmitters operating in the 5.25–5.35 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of -27dBm/MHz.
- (3) For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of -27dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

The following formula is used to convert the equipment isotropic radiated power(e.i.r.p.) to field strength (dBμV/m);

$$E = 1000000 \times \sqrt{30P} / 3 \mu\text{V/m}$$

where P is the EIRP in Watts

Therefore: -27 dBm/MHz = 68.23 dBuV/m

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3



For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table).

3.9.2.Test Procedures

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 30MHz, the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9kHz-90 kHz, 110kHz-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

For measurements below 1GHz the resolution bandwidth is set to 100kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements and as applicable for average measurements.

The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions. For measurements above 1 GHz, keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

3.9.3.Test Setup Layout

Refer to chapter 2.6.3 in this report.

3.9.4.Test Result

Refer to Annex A.9 in this report.



Annex A Test Data and Result

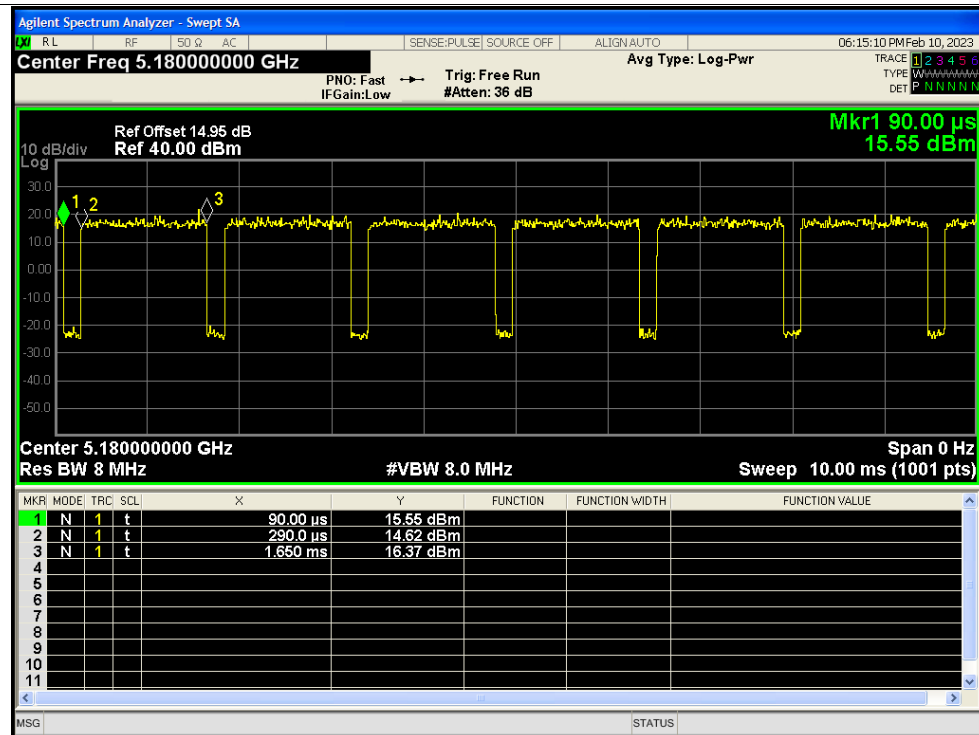
A.1. Duty Cycle of Test Signal

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	Ant1	87.18	0.60	0.74
NVNT	a	5220	Ant1	87.18	0.60	0.74
NVNT	a	5240	Ant1	87.18	0.60	0.74
NVNT	a	5745	Ant1	87.18	0.60	0.74
NVNT	a	5785	Ant1	87.18	0.60	0.74
NVNT	a	5825	Ant1	88.46	0.53	0.72
NVNT	n20	5180	Ant1	86.49	0.63	0.78
NVNT	n20	5220	Ant1	86.49	0.63	0.78
NVNT	n20	5240	Ant1	86.39	0.64	0.79
NVNT	n20	5745	Ant1	86.3	0.64	0.79
NVNT	n20	5785	Ant1	86.3	0.64	0.79
NVNT	n20	5825	Ant1	86.49	0.63	0.78
NVNT	n40	5190	Ant1	75.9	1.20	1.59
NVNT	n40	5230	Ant1	77.11	1.13	1.56
NVNT	n40	5755	Ant1	76.19	1.18	1.56
NVNT	n40	5795	Ant1	76.19	1.18	1.56

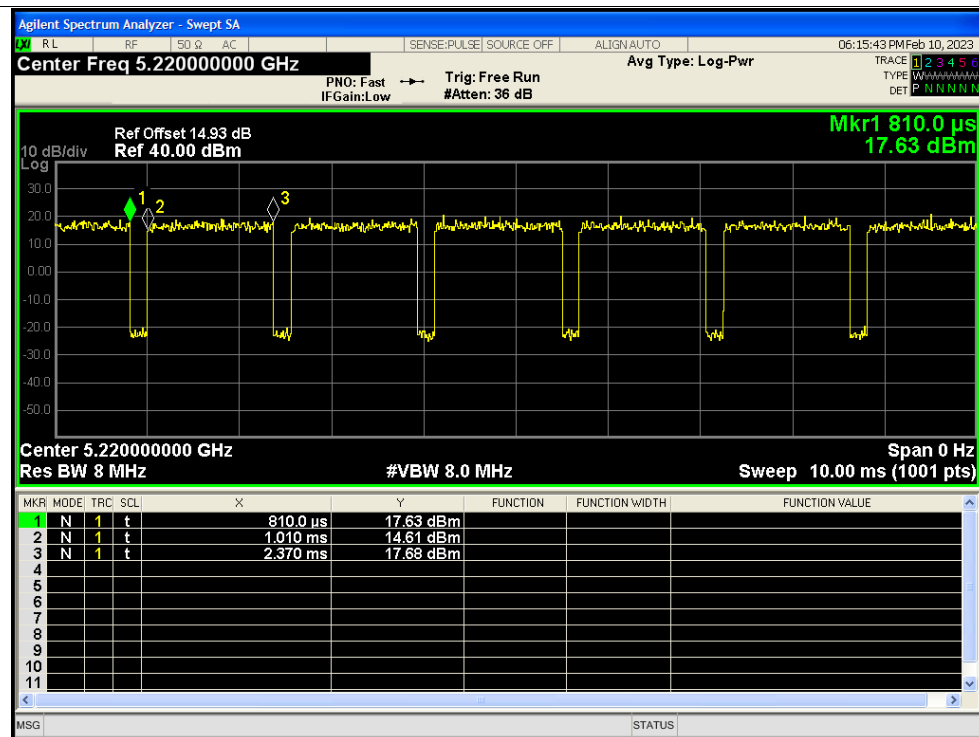


Test Graphs

Duty Cycle NVNT a 5180MHz Ant1

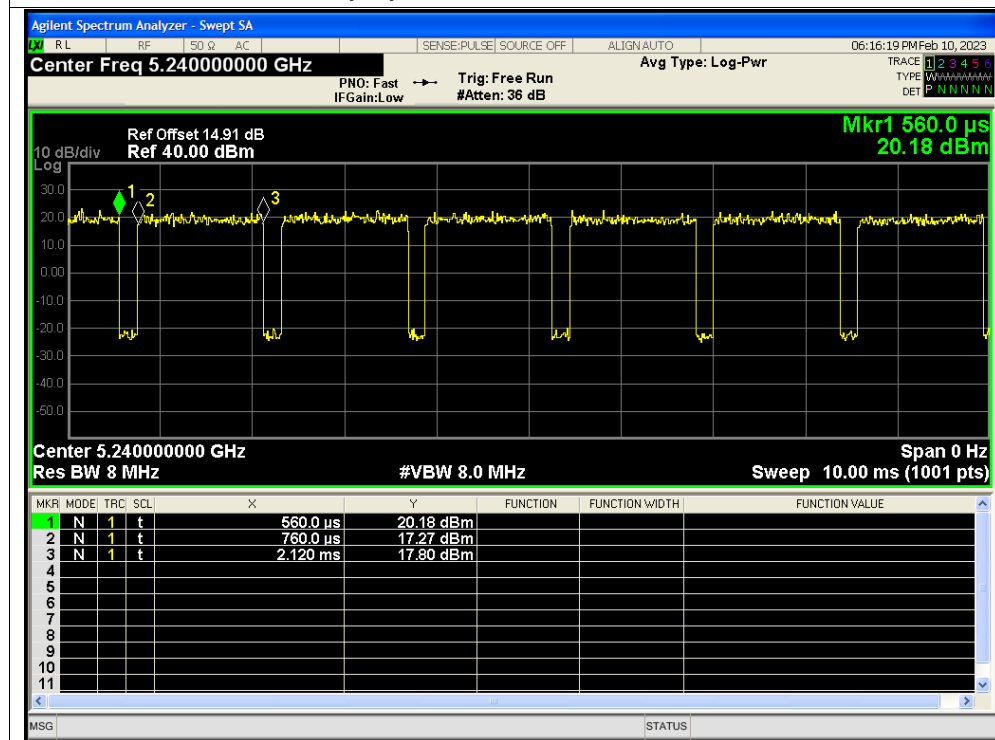


Duty Cycle NVNT a 5220MHz Ant1

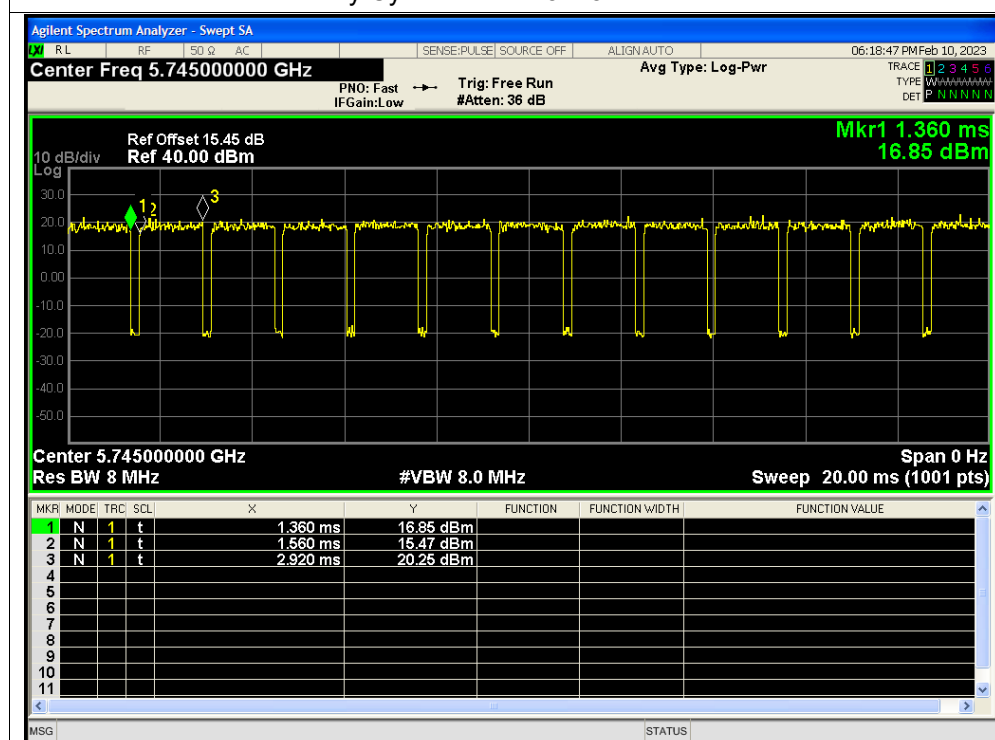




Duty Cycle NVNT a 5240MHz Ant1

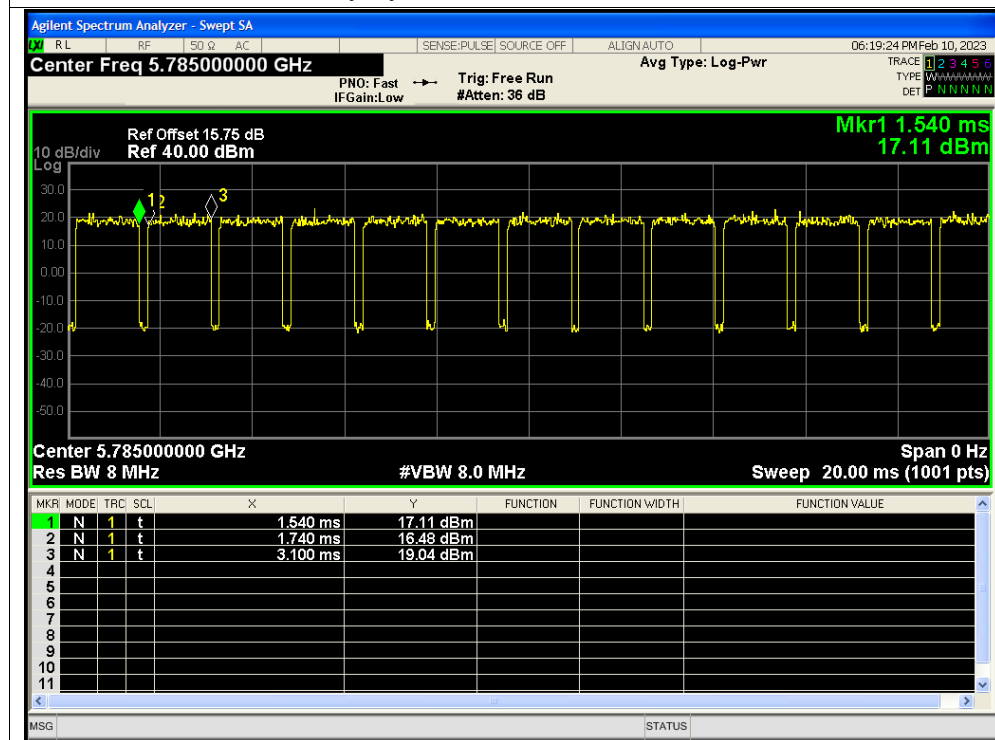


Duty Cycle NVNT a 5745MHz Ant1

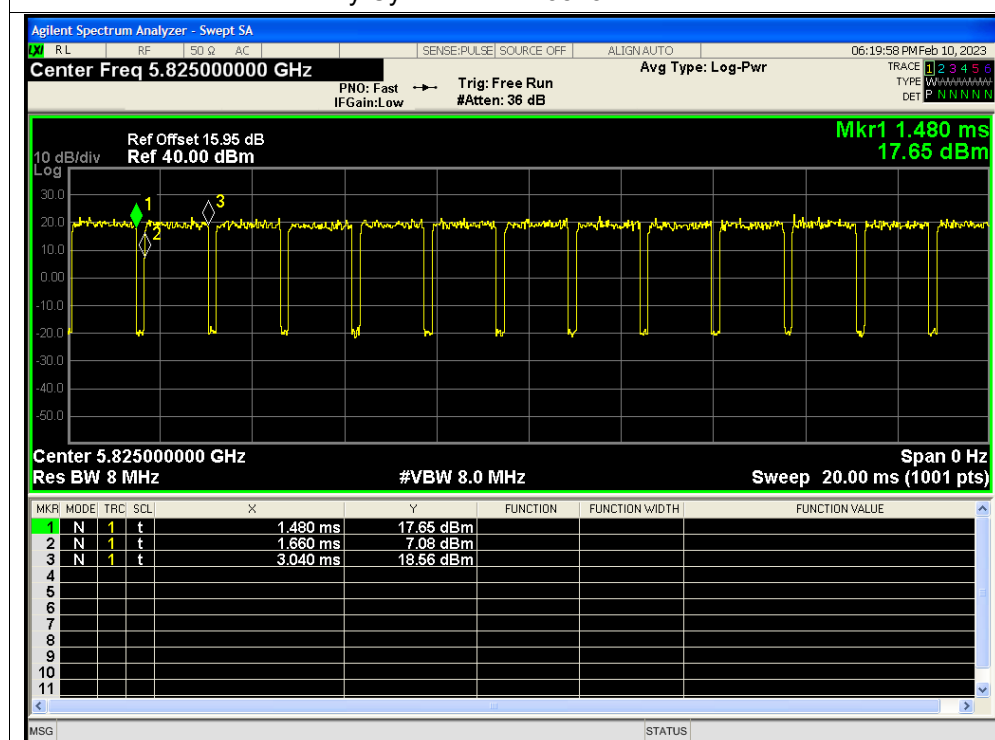




Duty Cycle NVNT a 5785MHz Ant1

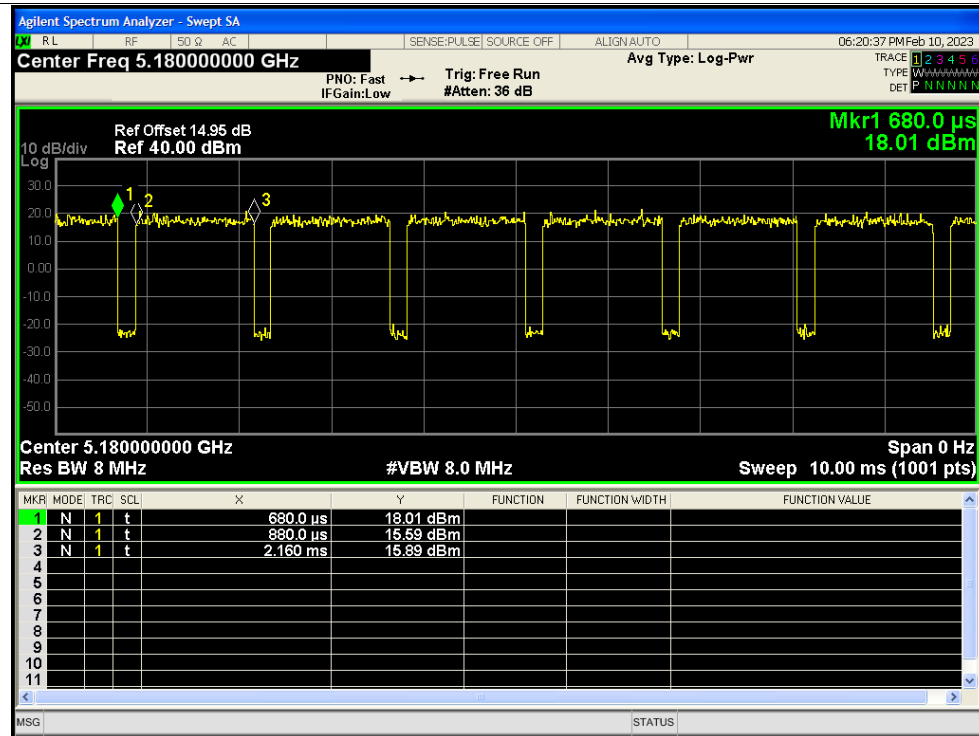


Duty Cycle NVNT a 5825MHz Ant1

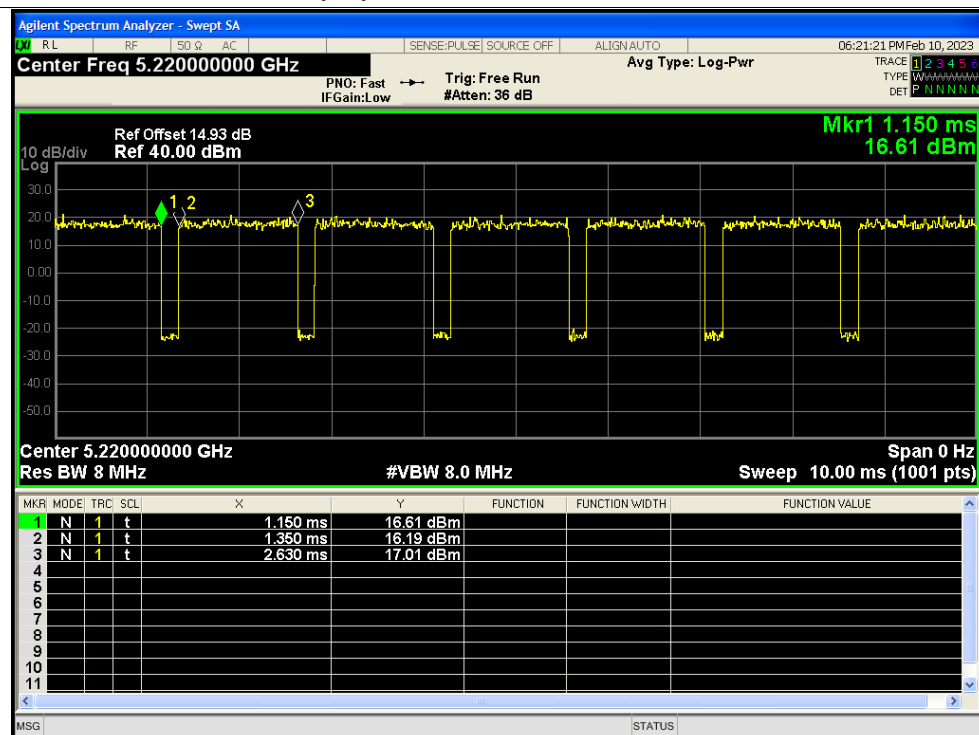




Duty Cycle NVNT n20 5180MHz Ant1

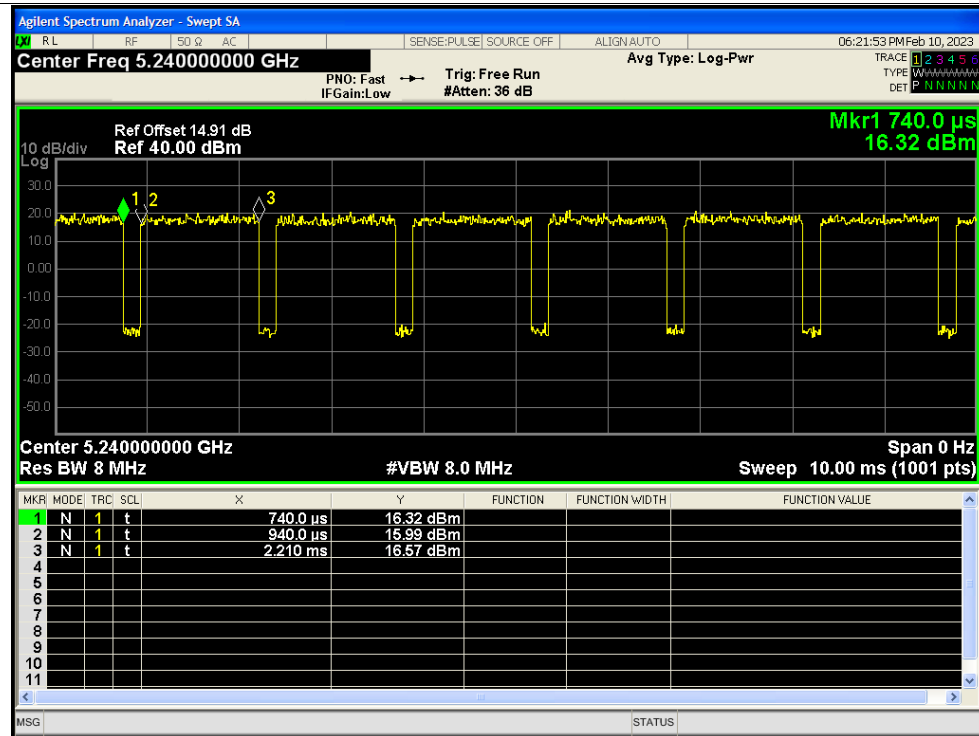


Duty Cycle NVNT n20 5220MHz Ant1

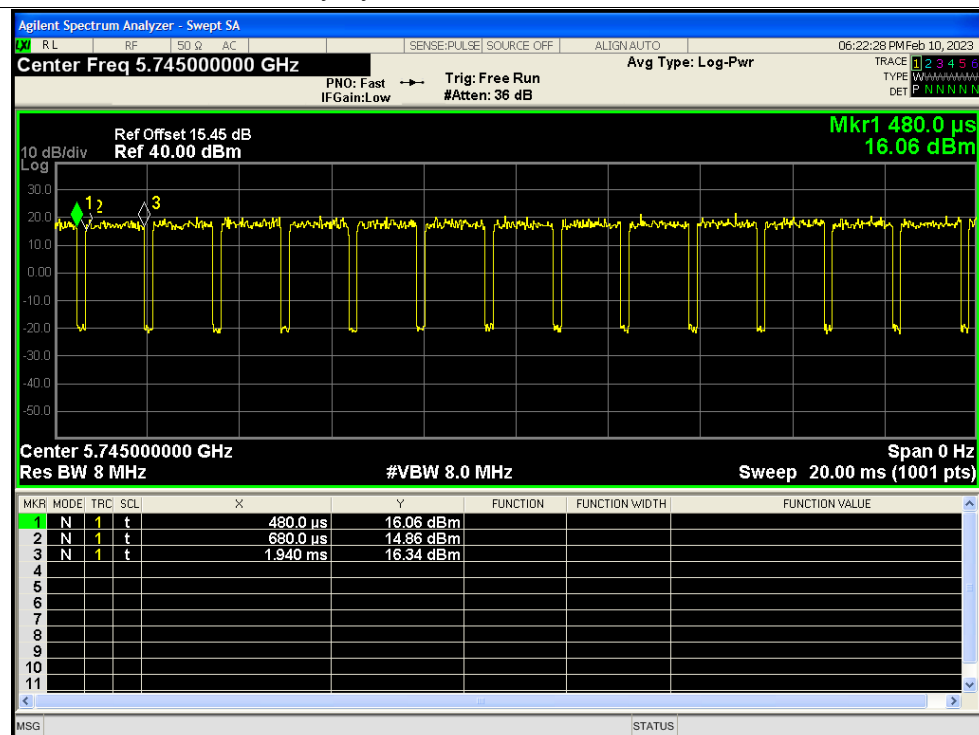




Duty Cycle NVNT n20 5240MHz Ant1

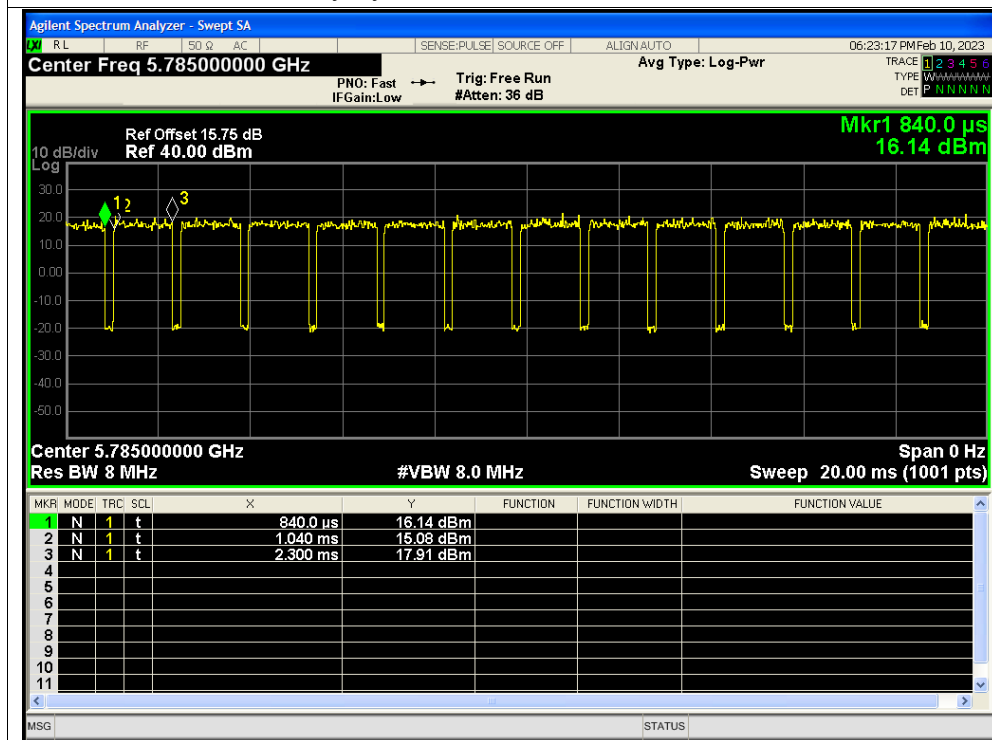


Duty Cycle NVNT n20 5745MHz Ant1

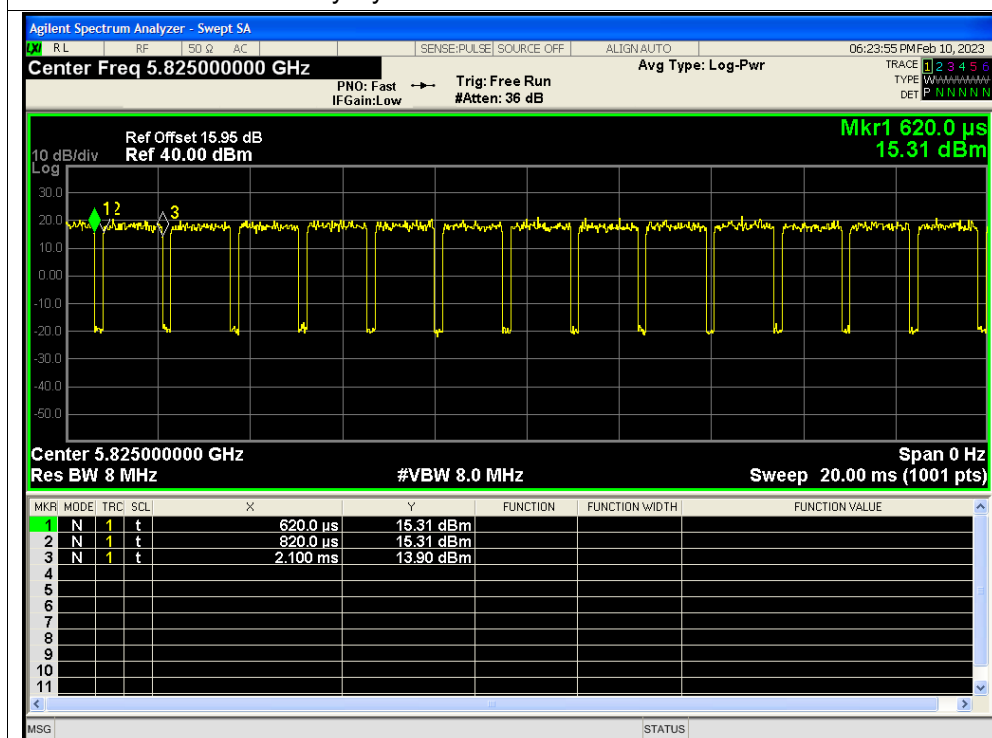




Duty Cycle NVNT n20 5785MHz Ant1

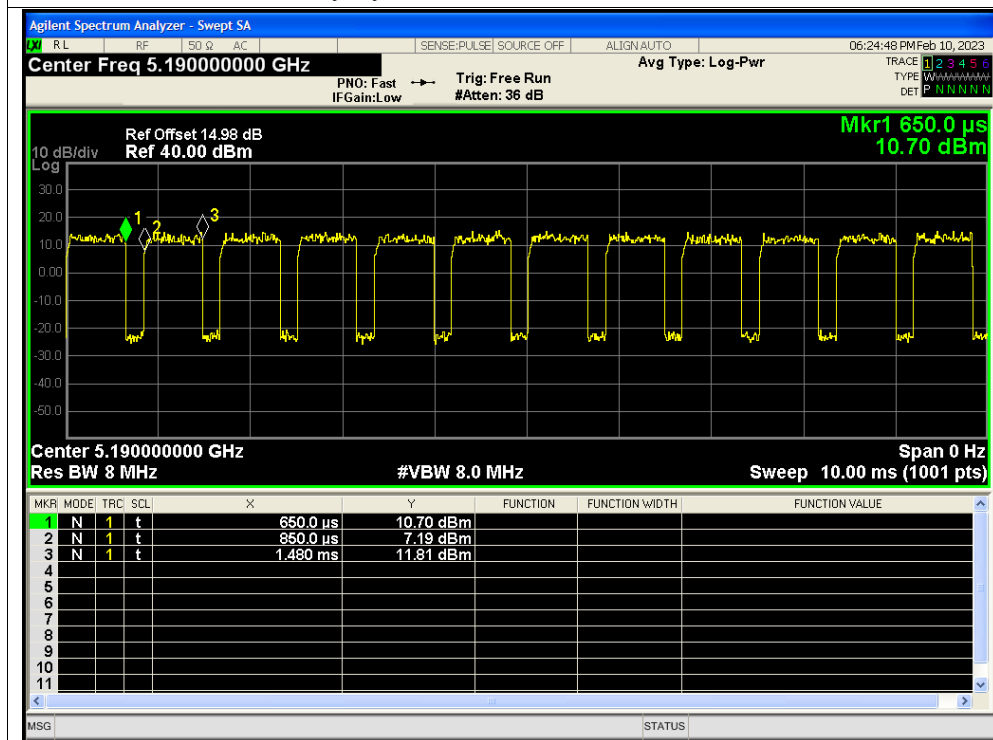


Duty Cycle NVNT n20 5825MHz Ant1

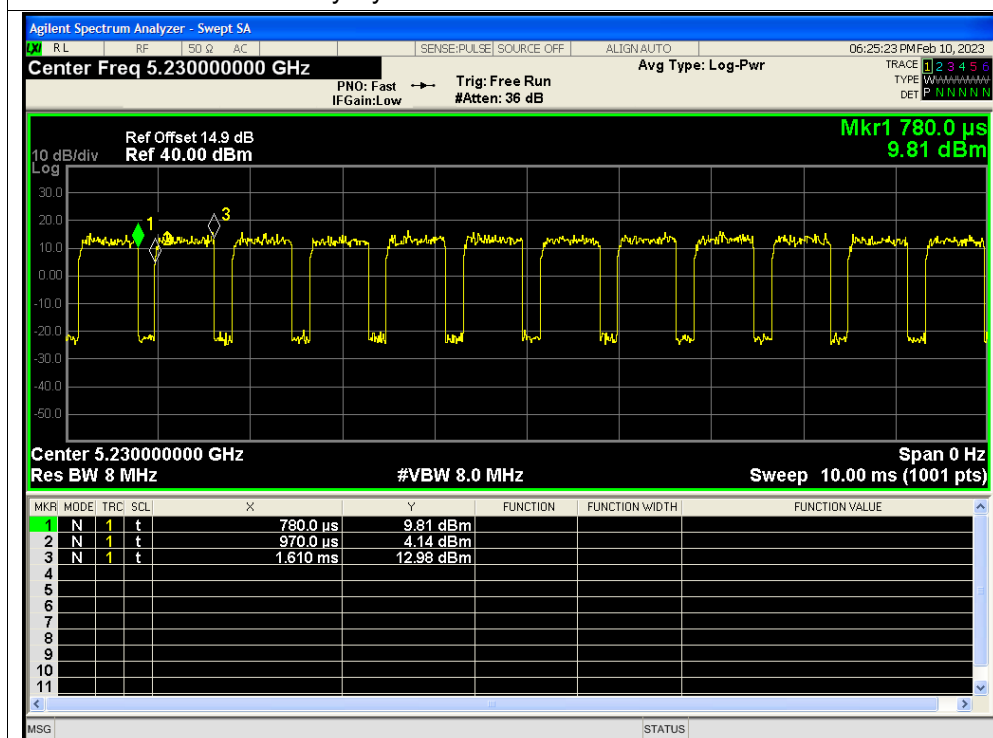




Duty Cycle NVNT n40 5190MHz Ant1

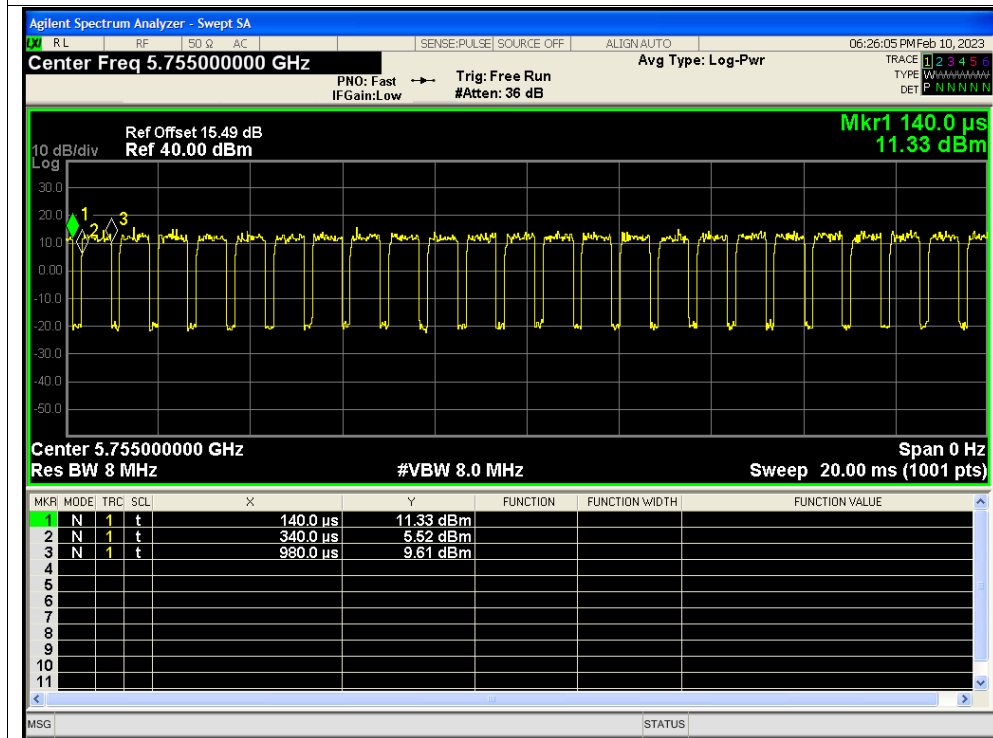


Duty Cycle NVNT n40 5230MHz Ant1

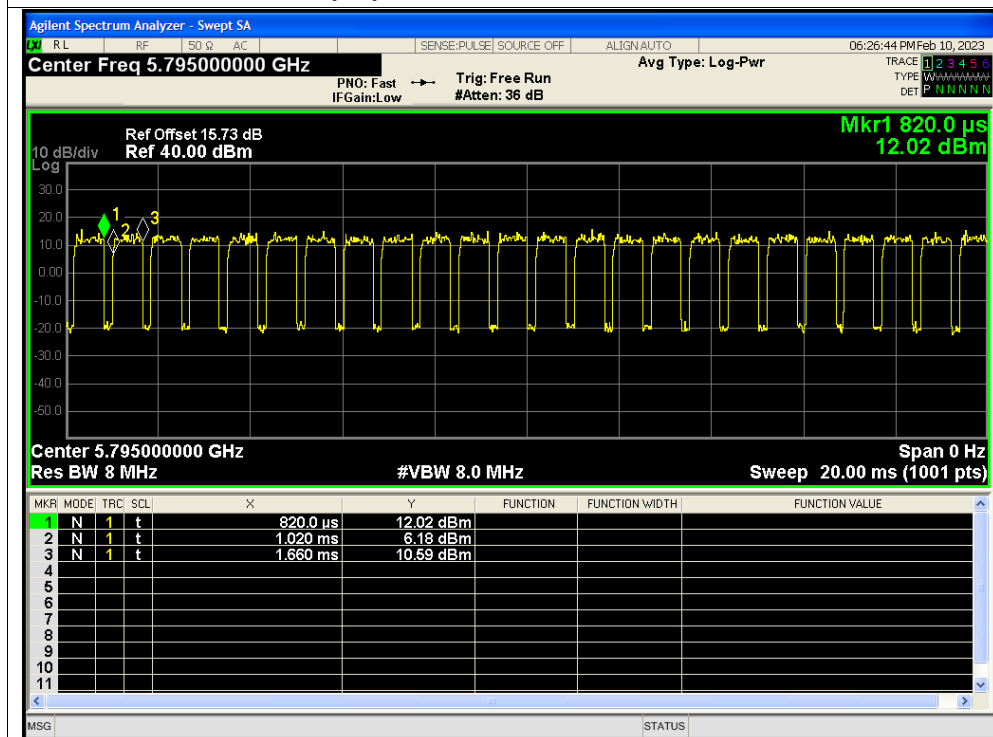




Duty Cycle NVNT n40 5755MHz Ant1



Duty Cycle NVNT n40 5795MHz Ant1



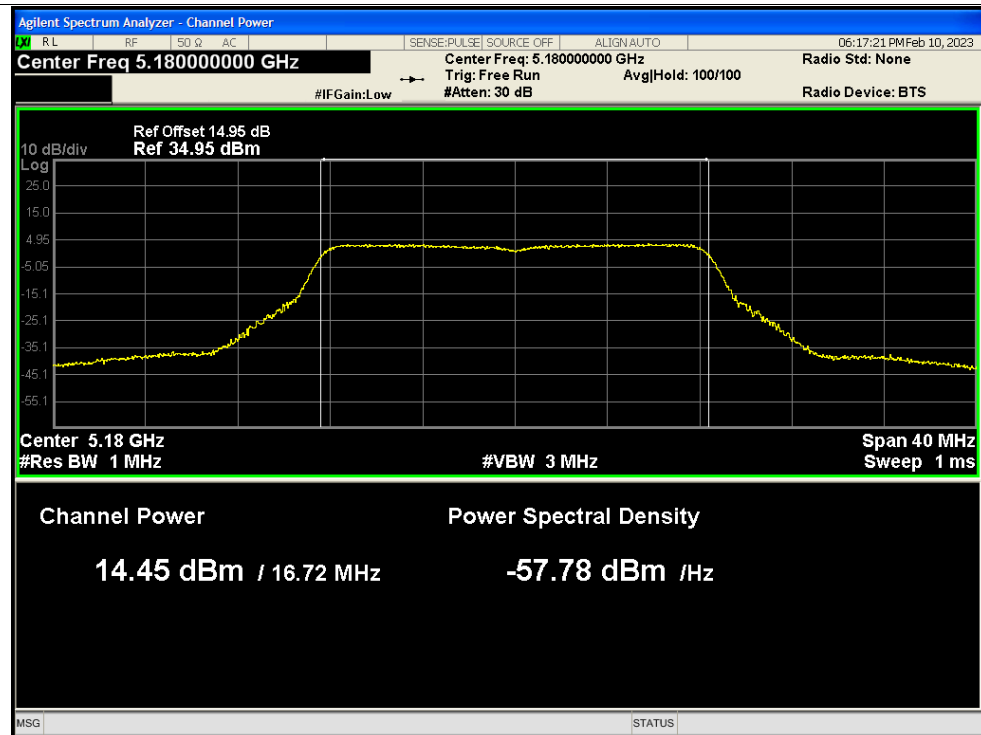
**A.2. Maximum Conducted Output Power**

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	Ant1	14.45	0.60	15.05	24	Pass
NVNT	a	5220	Ant1	14.97	0.60	15.57	24	Pass
NVNT	a	5240	Ant1	15.01	0.60	15.61	24	Pass
NVNT	a	5745	Ant1	14.02	0.60	14.62	30	Pass
NVNT	a	5785	Ant1	13.79	0.60	14.39	30	Pass
NVNT	a	5825	Ant1	14.25	0.53	14.78	30	Pass
NVNT	n20	5180	Ant1	13.18	0.63	13.81	24	Pass
NVNT	n20	5220	Ant1	13.73	0.63	14.36	24	Pass
NVNT	n20	5240	Ant1	13.65	0.64	14.29	24	Pass
NVNT	n20	5745	Ant1	12.96	0.64	13.60	30	Pass
NVNT	n20	5785	Ant1	12.31	0.64	12.95	30	Pass
NVNT	n20	5825	Ant1	13.36	0.63	13.99	30	Pass
NVNT	n40	5190	Ant1	10.72	1.20	11.92	24	Pass
NVNT	n40	5230	Ant1	11.27	1.13	12.40	24	Pass
NVNT	n40	5755	Ant1	10.27	1.18	11.45	30	Pass
NVNT	n40	5795	Ant1	10.44	1.18	11.62	30	Pass

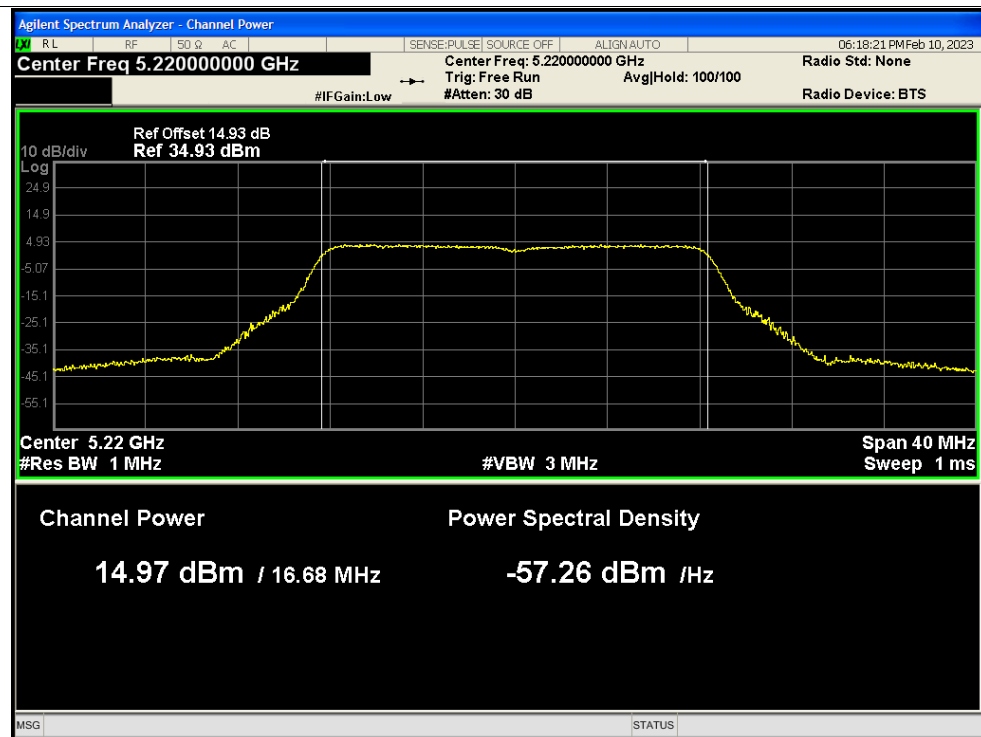


Test Graphs

Power NVNT a 5180MHz Ant1

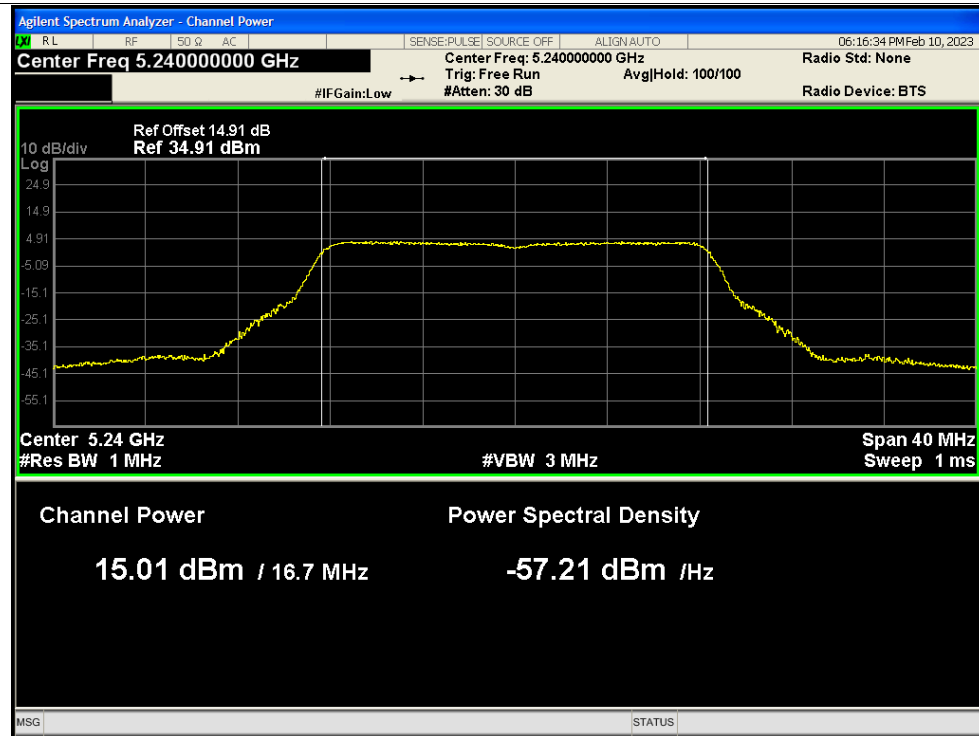


Power NVNT a 5220MHz Ant1

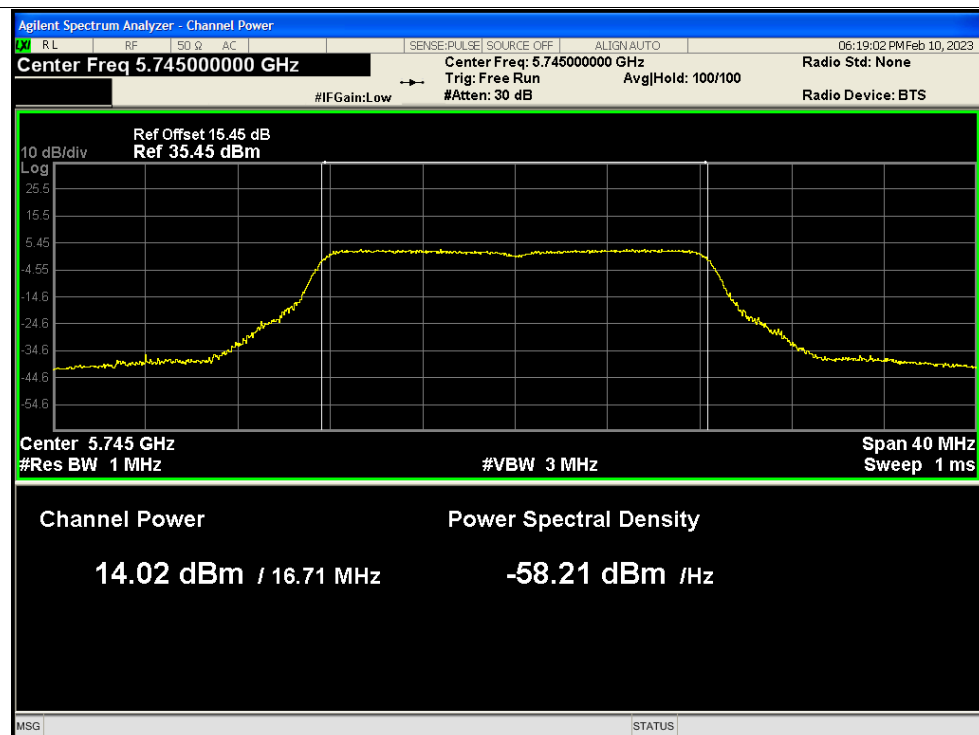




Power NVNT a 5240MHz Ant1

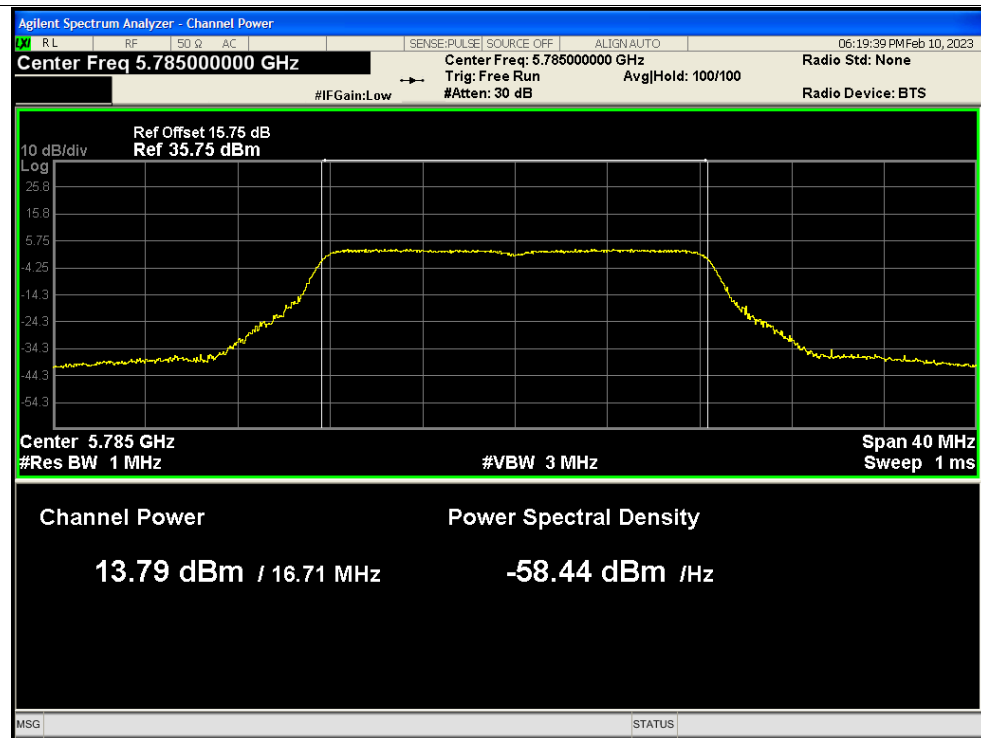


Power NVNT a 5745MHz Ant1

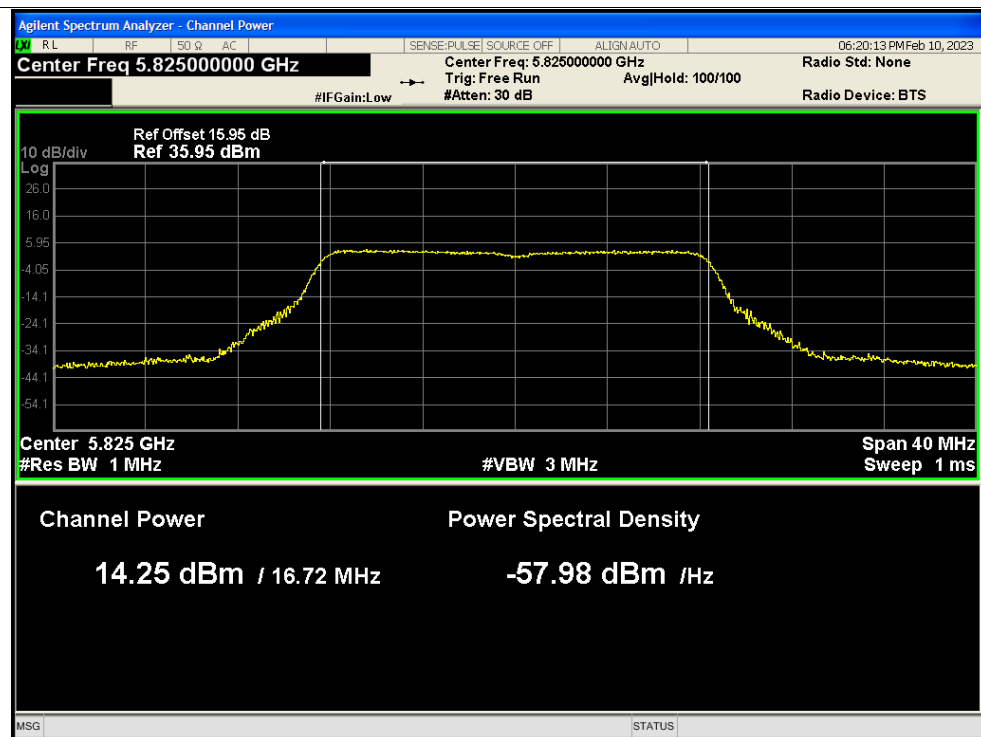




Power NVNT a 5785MHz Ant1

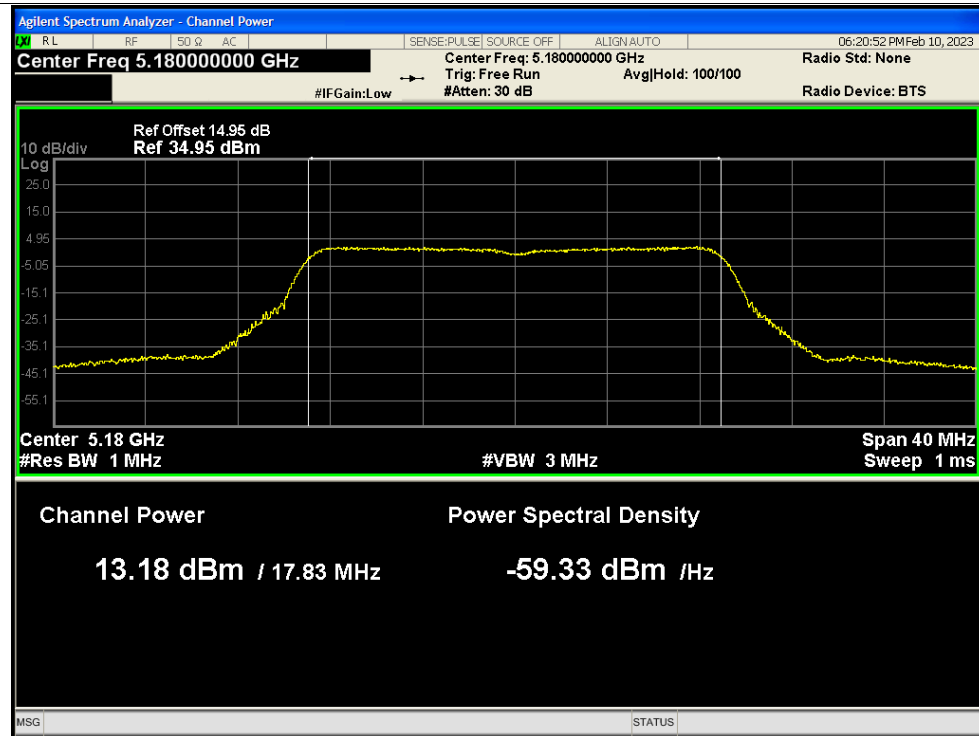


Power NVNT a 5825MHz Ant1

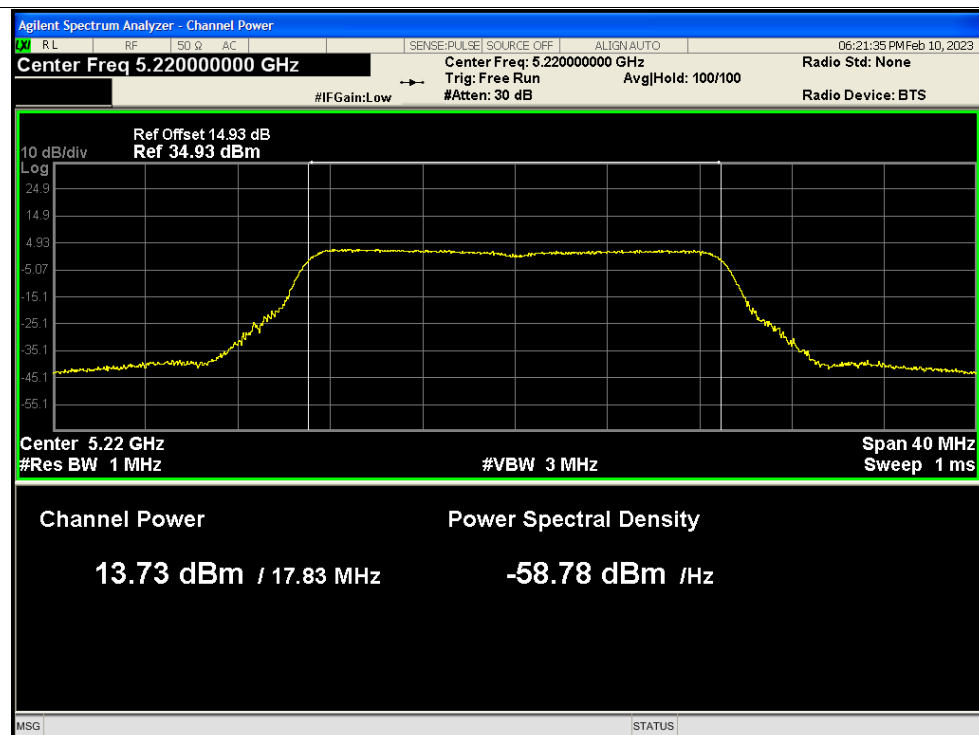




Power NVNT n20 5180MHz Ant1

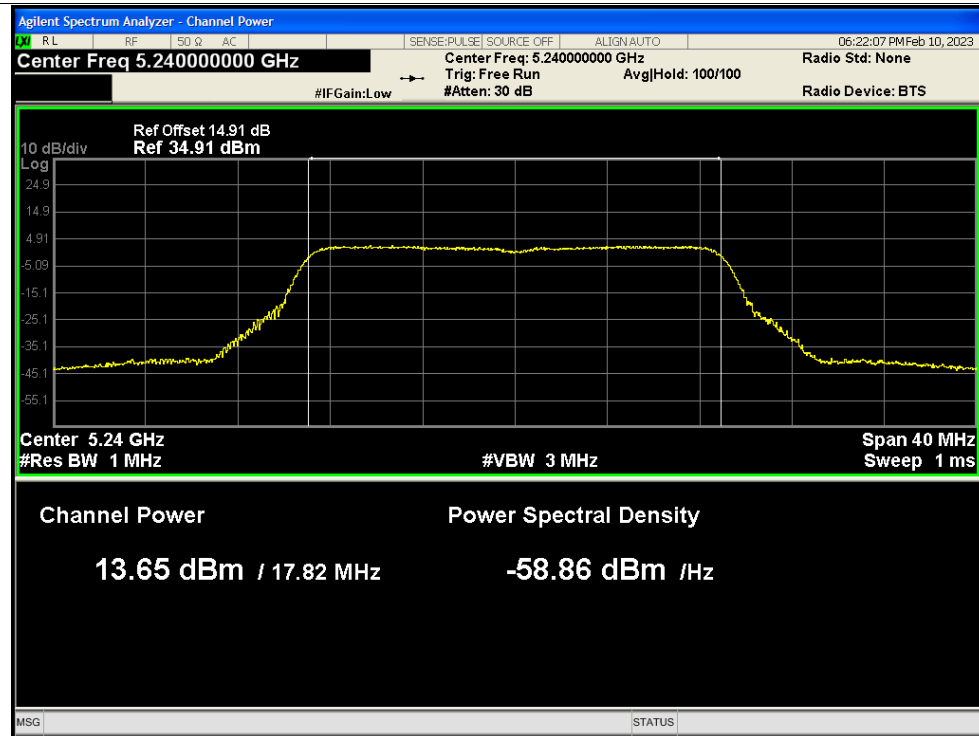


Power NVNT n20 5220MHz Ant1

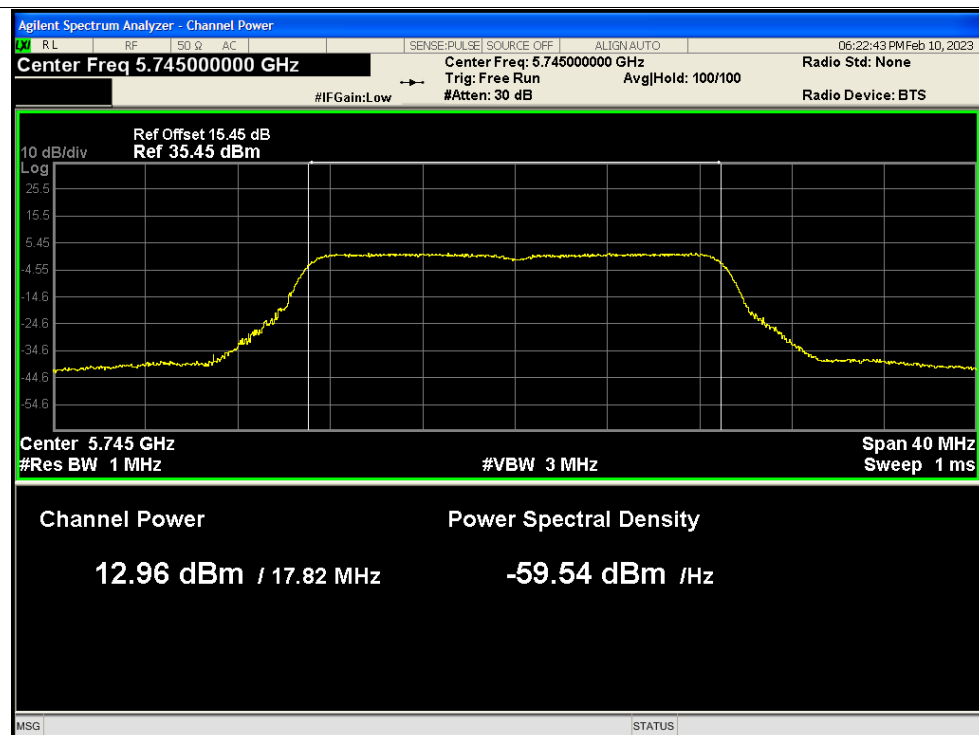




Power NVNT n20 5240MHz Ant1

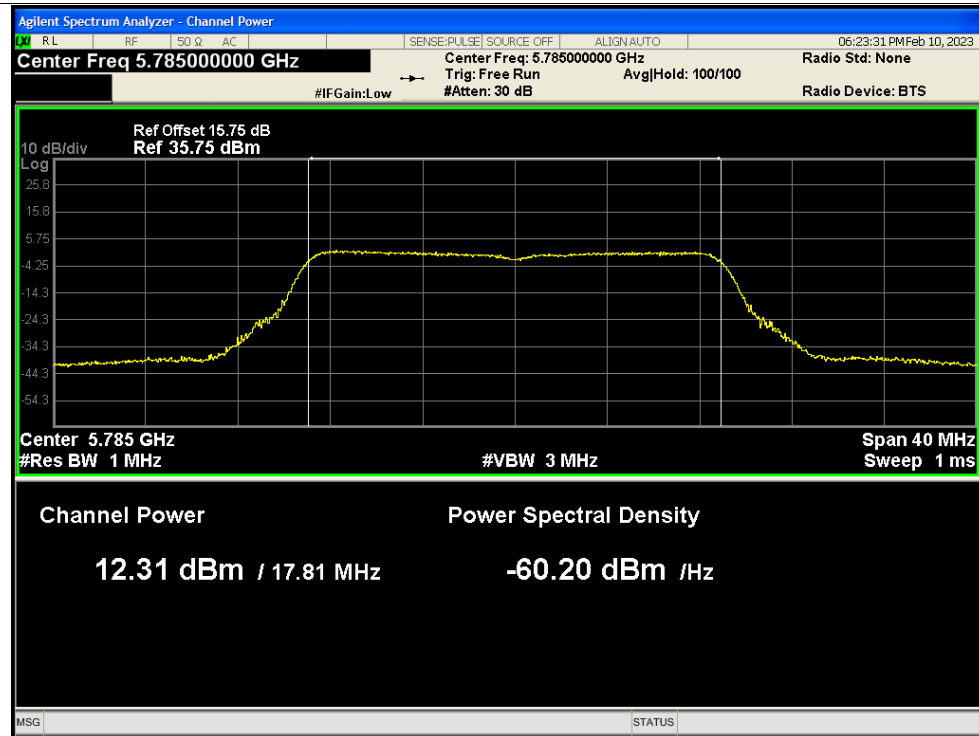


Power NVNT n20 5745MHz Ant1

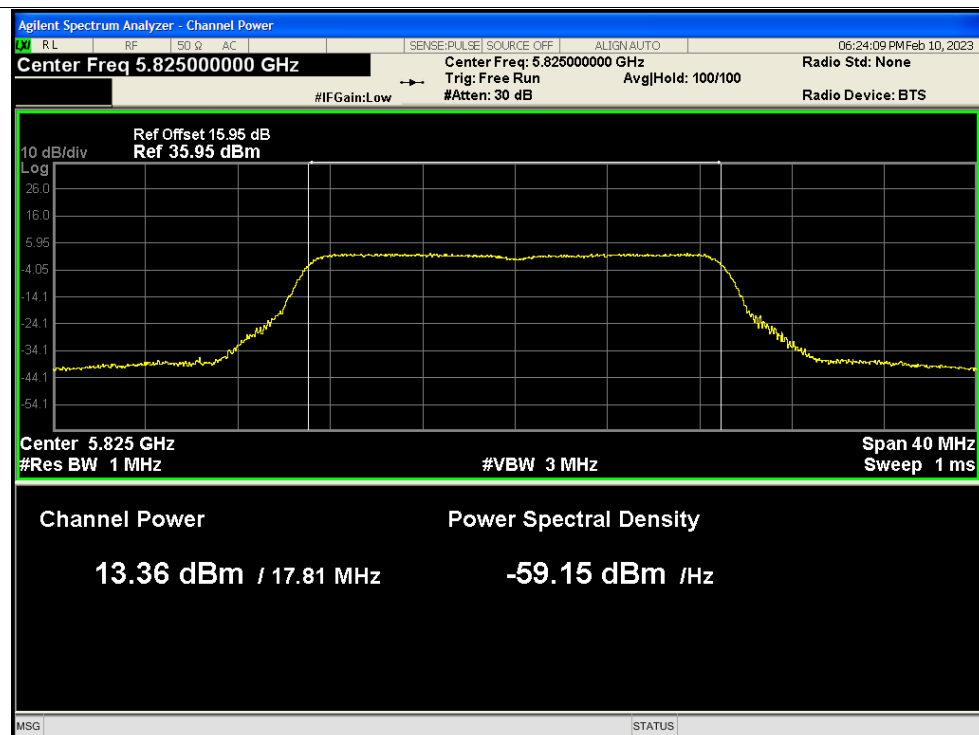




Power NVNT n20 5785MHz Ant1

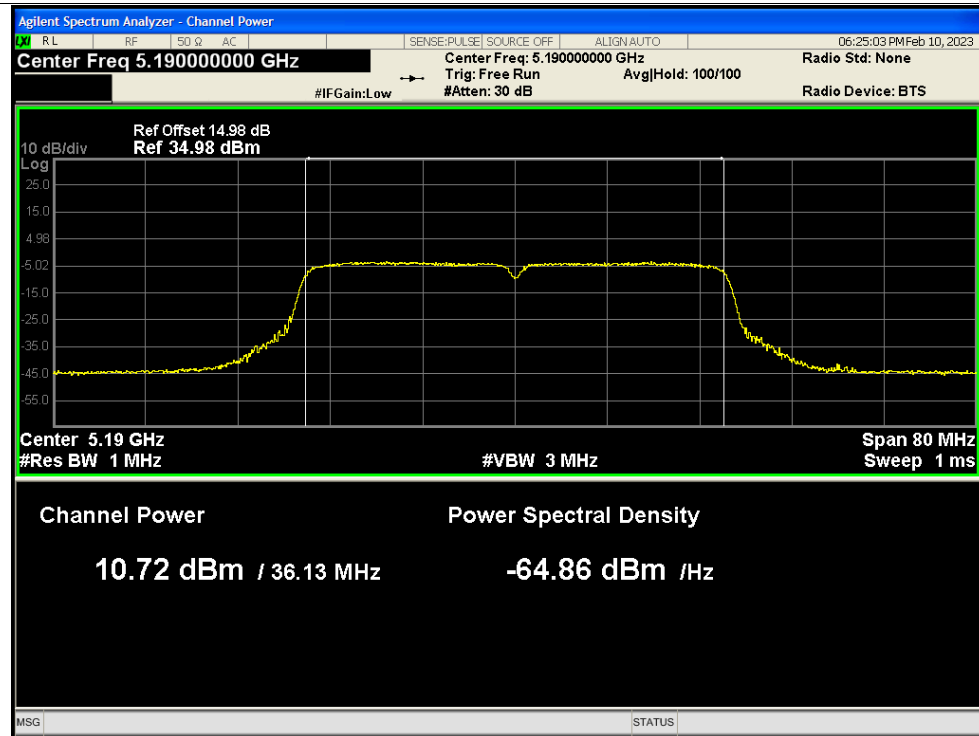


Power NVNT n20 5825MHz Ant1

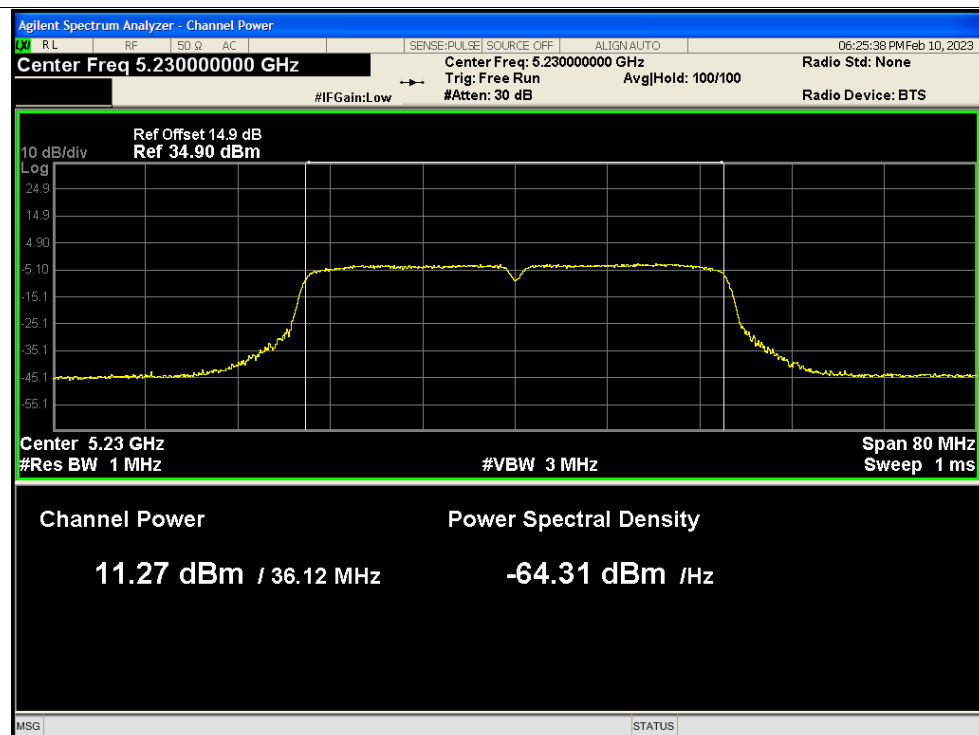




Power NVNT n40 5190MHz Ant1

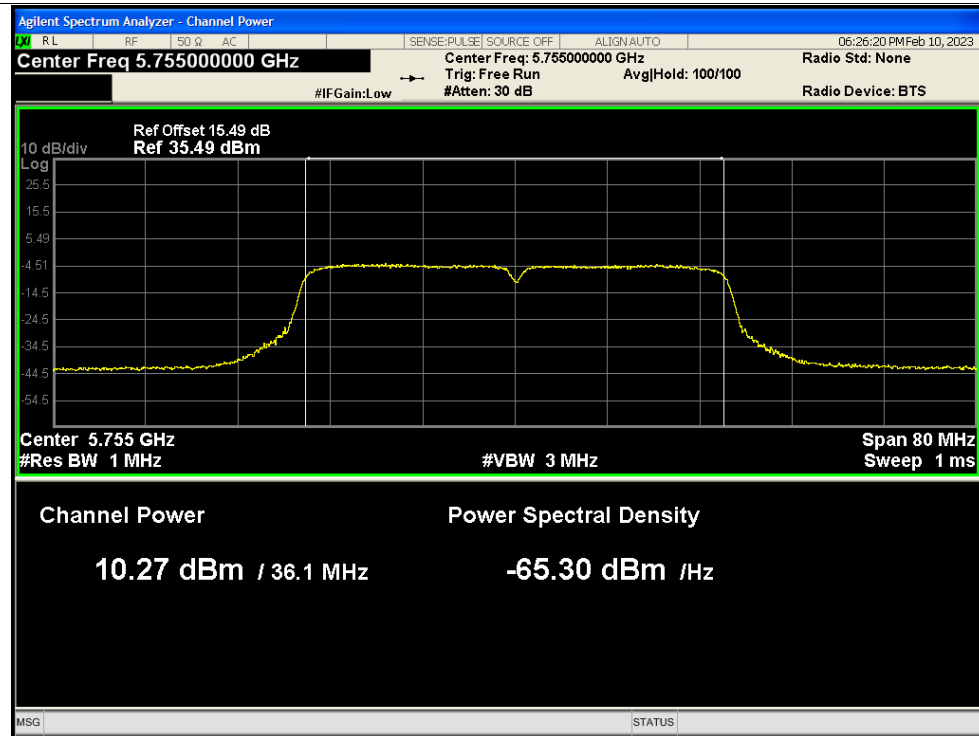


Power NVNT n40 5230MHz Ant1

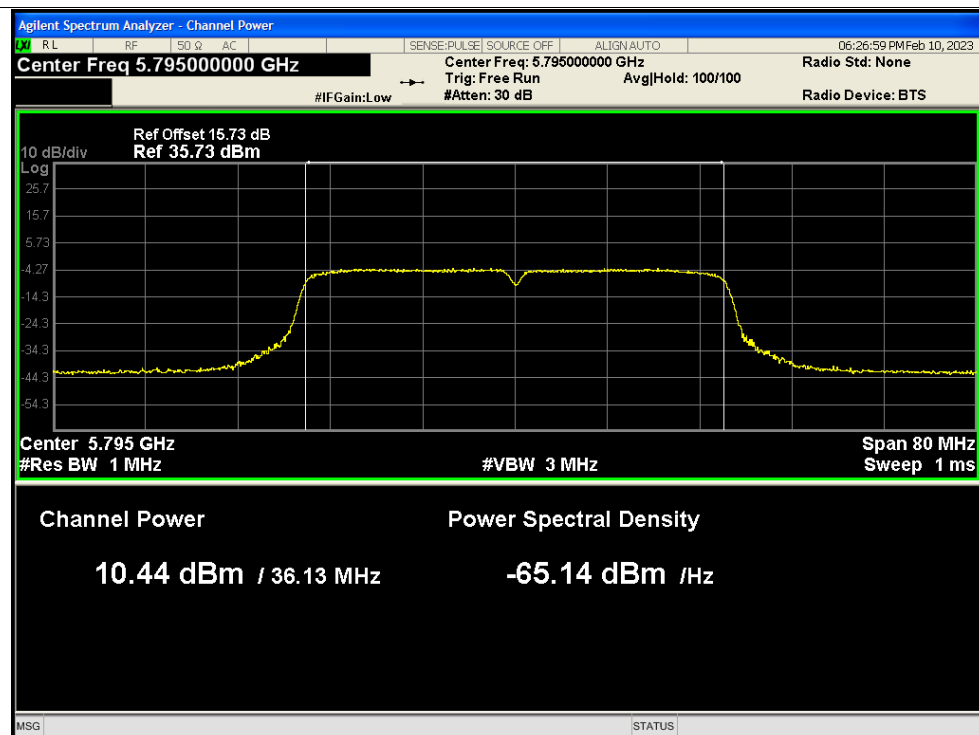




Power NVNT n40 5755MHz Ant1



Power NVNT n40 5795MHz Ant1



**A.3. Emission Bandwidth**

Condition	Mode	Frequency (MHz)	Antenna	-26 dB Bandwidth (MHz)	Verdict
NVNT	a	5180	Ant1	22.423	Pass
NVNT	a	5220	Ant1	22.188	Pass
NVNT	a	5240	Ant1	21.92	Pass
NVNT	n20	5180	Ant1	22.179	Pass
NVNT	n20	5220	Ant1	22.544	Pass
NVNT	n20	5240	Ant1	22.501	Pass
NVNT	n40	5190	Ant1	50.425	Pass
NVNT	n40	5230	Ant1	51.796	Pass



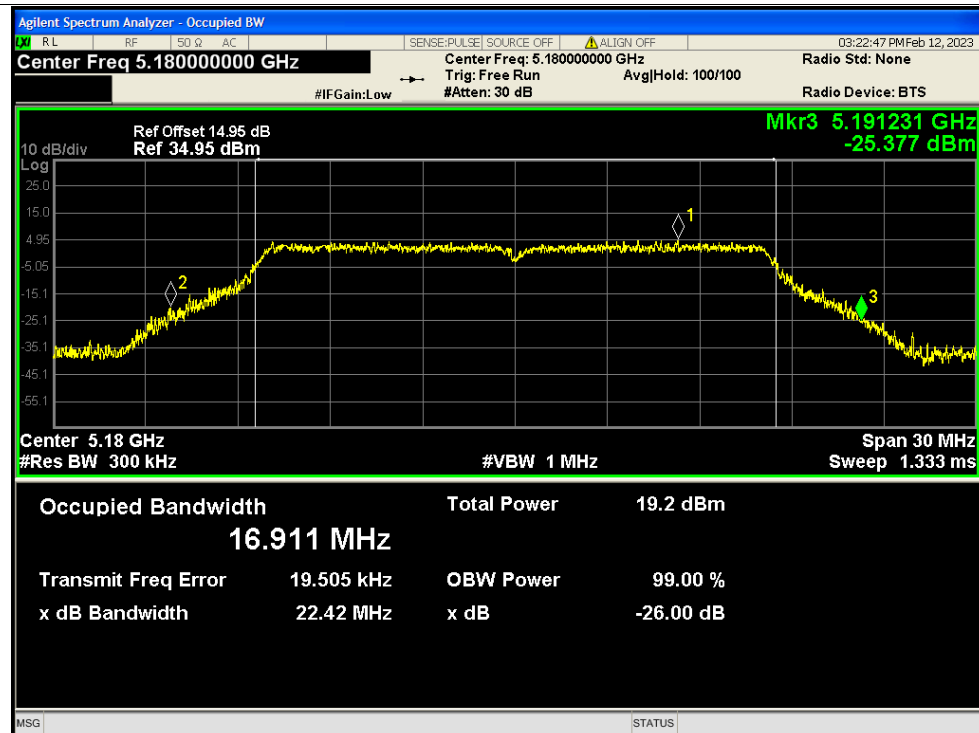
REPORT No.: SZ23010190W04

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	a	5745	Ant1	16.448	0.5	Pass
NVNT	a	5785	Ant1	16.386	0.5	Pass
NVNT	a	5825	Ant1	16.454	0.5	Pass
NVNT	n20	5745	Ant1	17.591	0.5	Pass
NVNT	n20	5785	Ant1	17.592	0.5	Pass
NVNT	n20	5825	Ant1	17.612	0.5	Pass
NVNT	n40	5755	Ant1	35.101	0.5	Pass
NVNT	n40	5795	Ant1	35.302	0.5	Pass

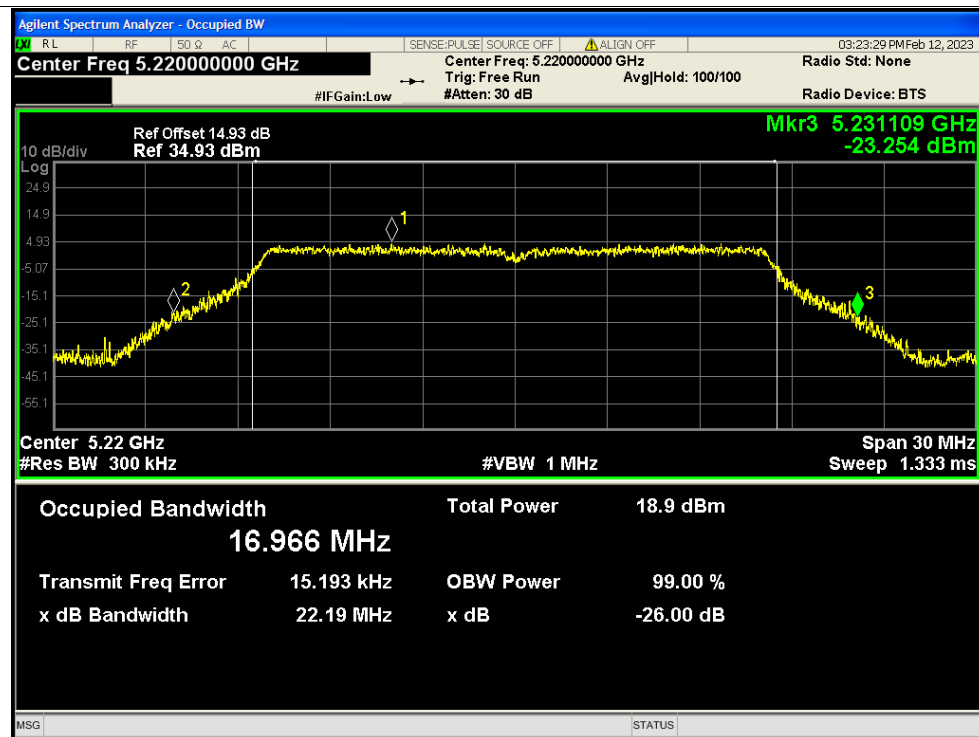


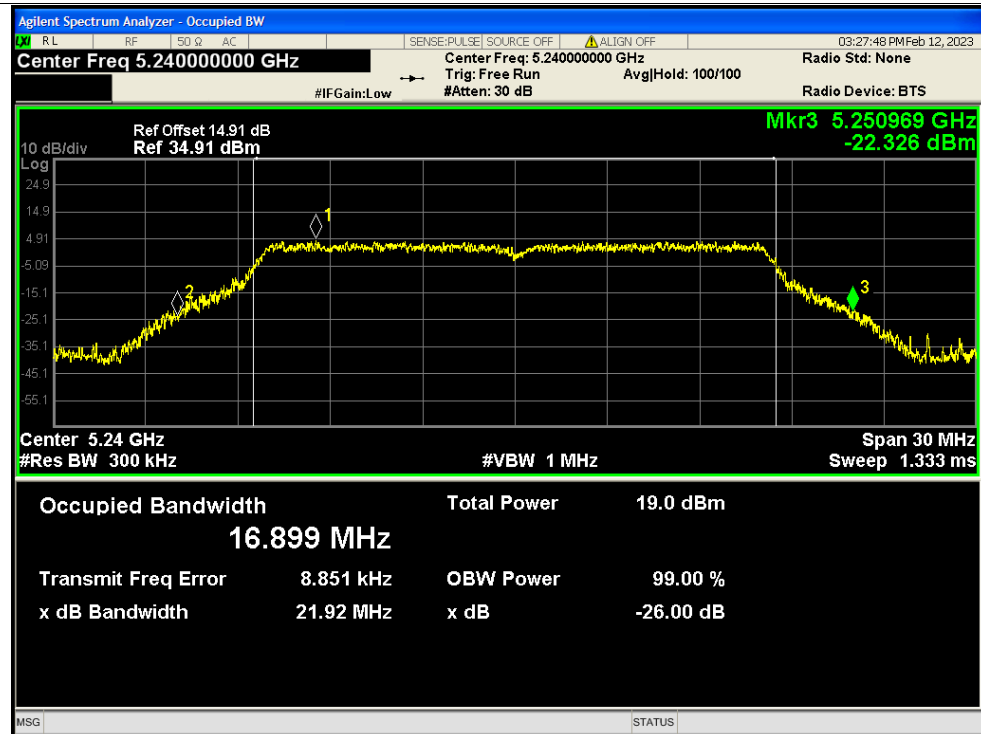
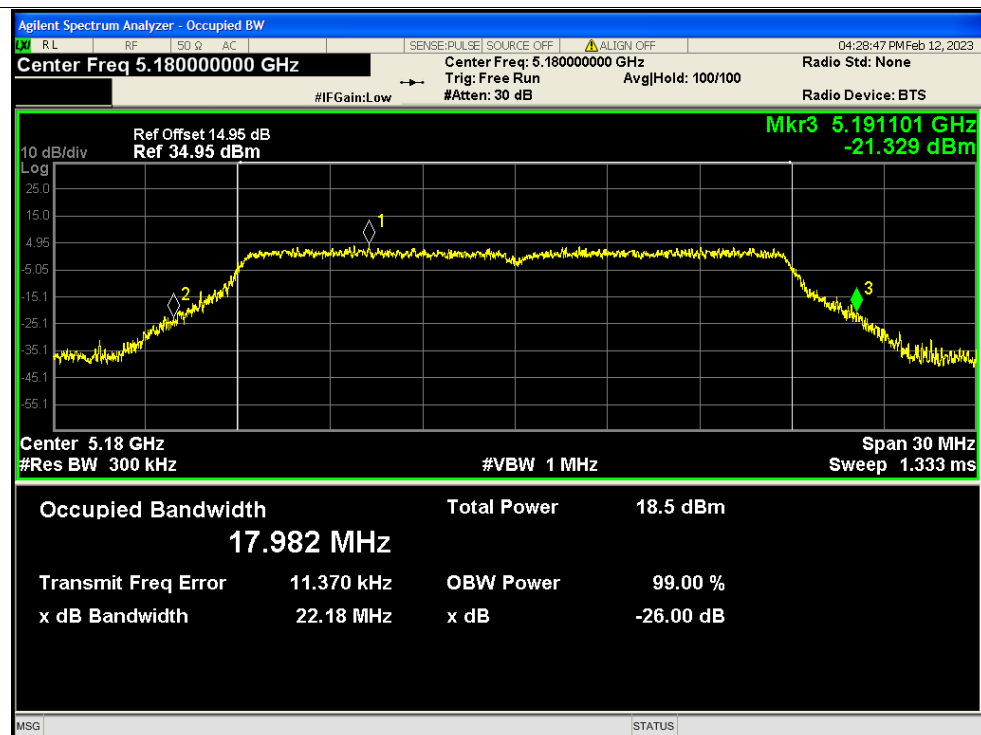
Test Graphs

-26dB Bandwidth NVNT a 5180MHz Ant1



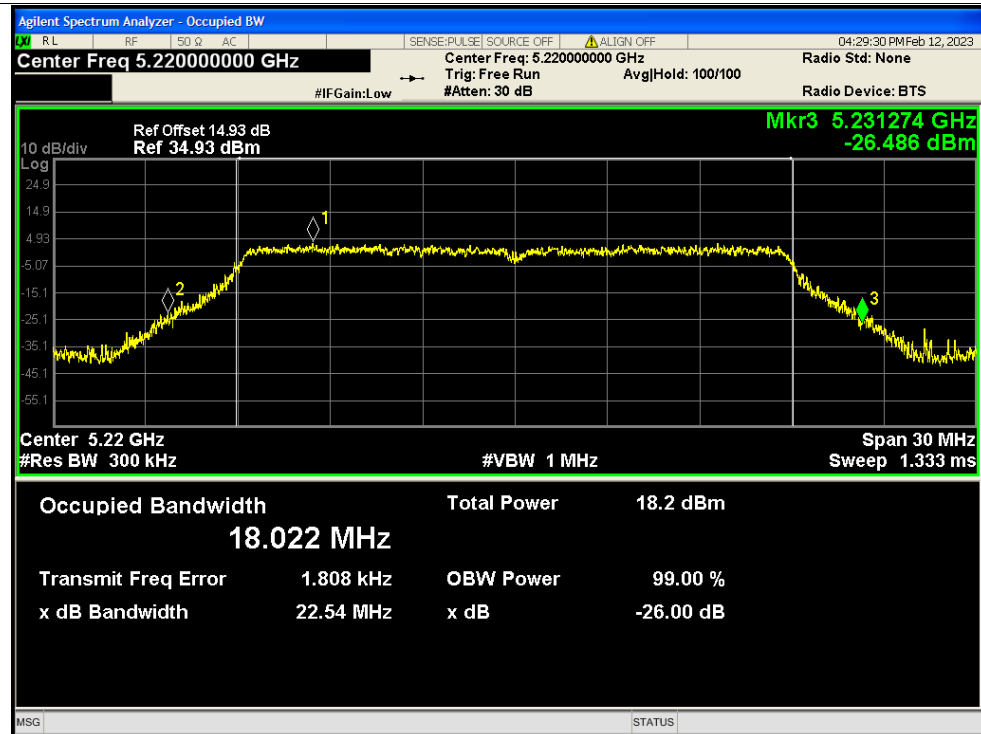
-26dB Bandwidth NVNT a 5220MHz Ant1



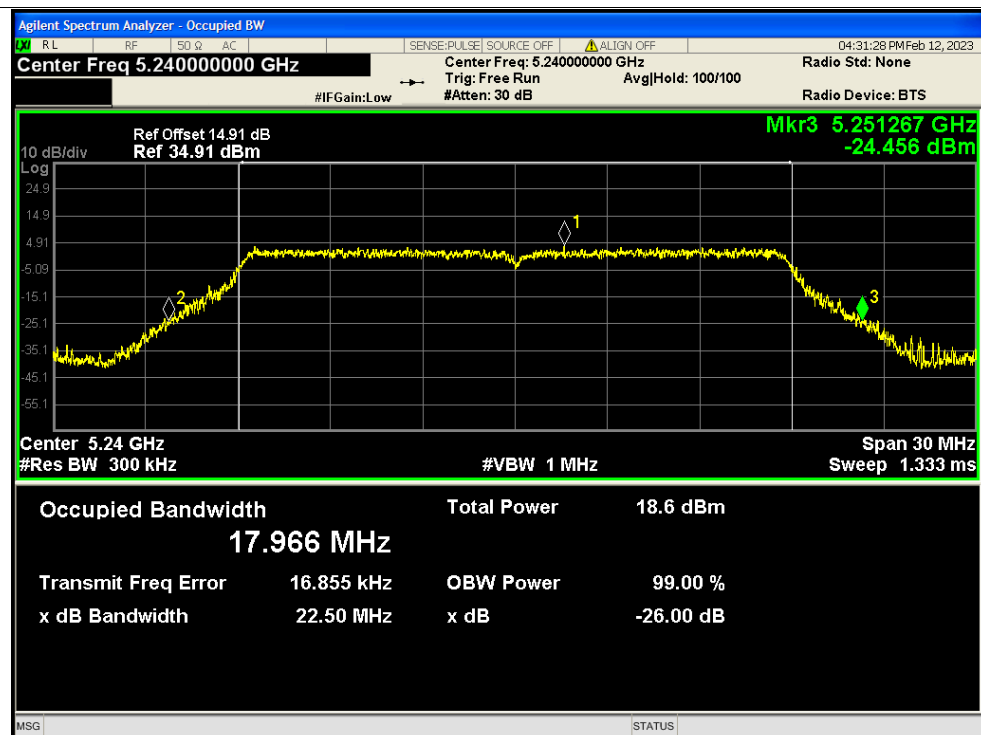
**-26dB Bandwidth NVNT a 5240MHz Ant1****-26dB Bandwidth NVNT n20 5180MHz Ant1**



-26dB Bandwidth NVNT n20 5220MHz Ant1

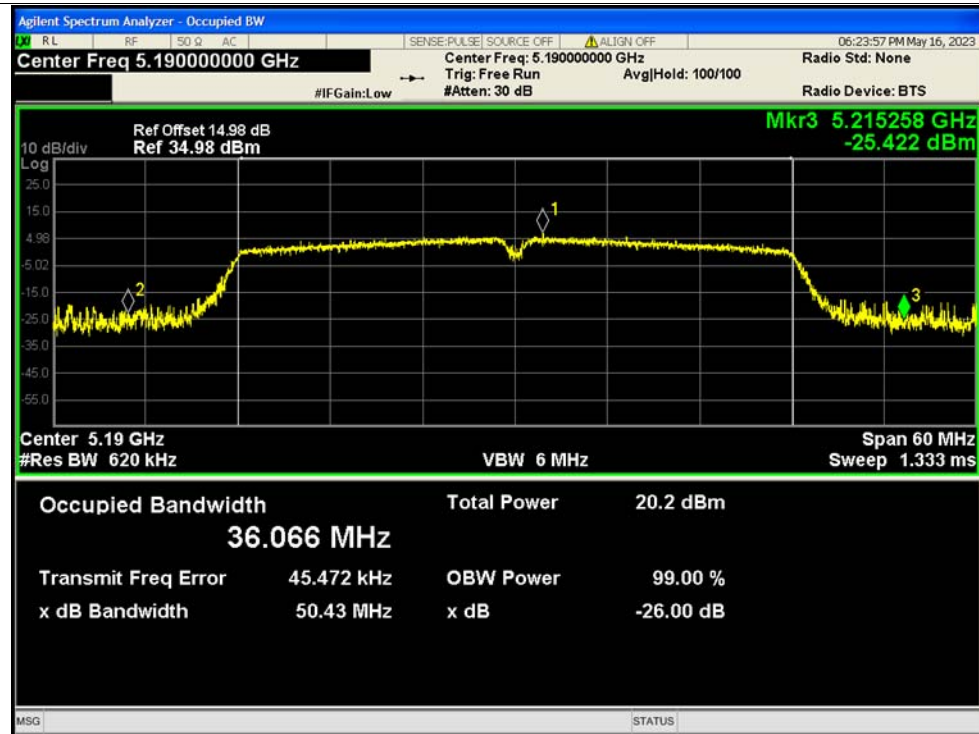


-26dB Bandwidth NVNT n20 5240MHz Ant1





-26dB Bandwidth NVNT n40 5190MHz Ant1



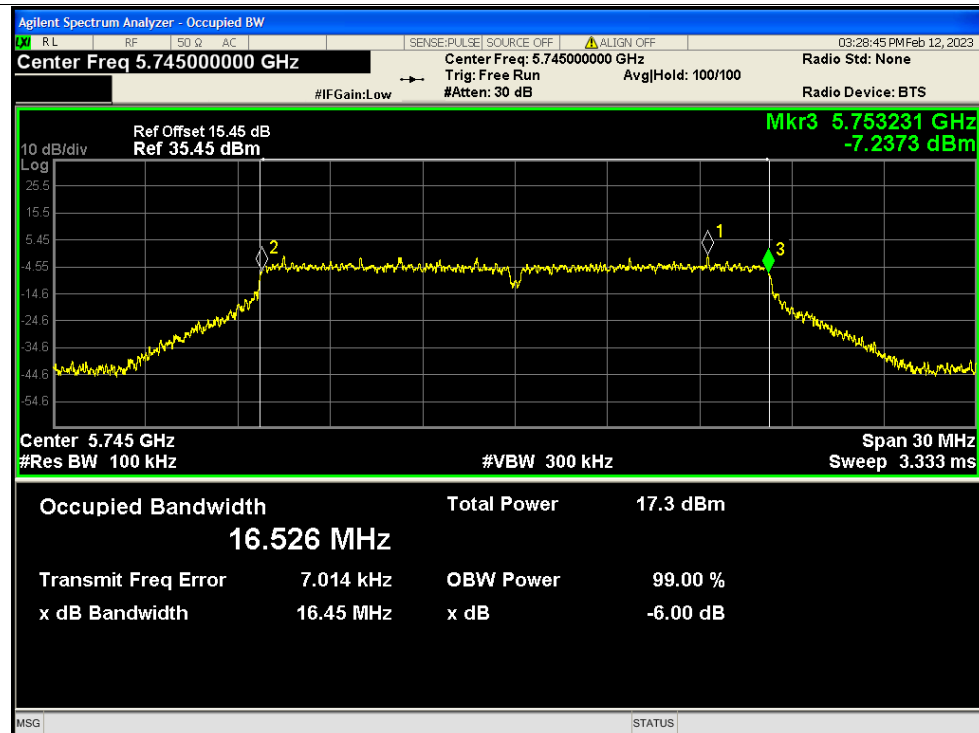
-26dB Bandwidth NVNT n40 5230MHz Ant1



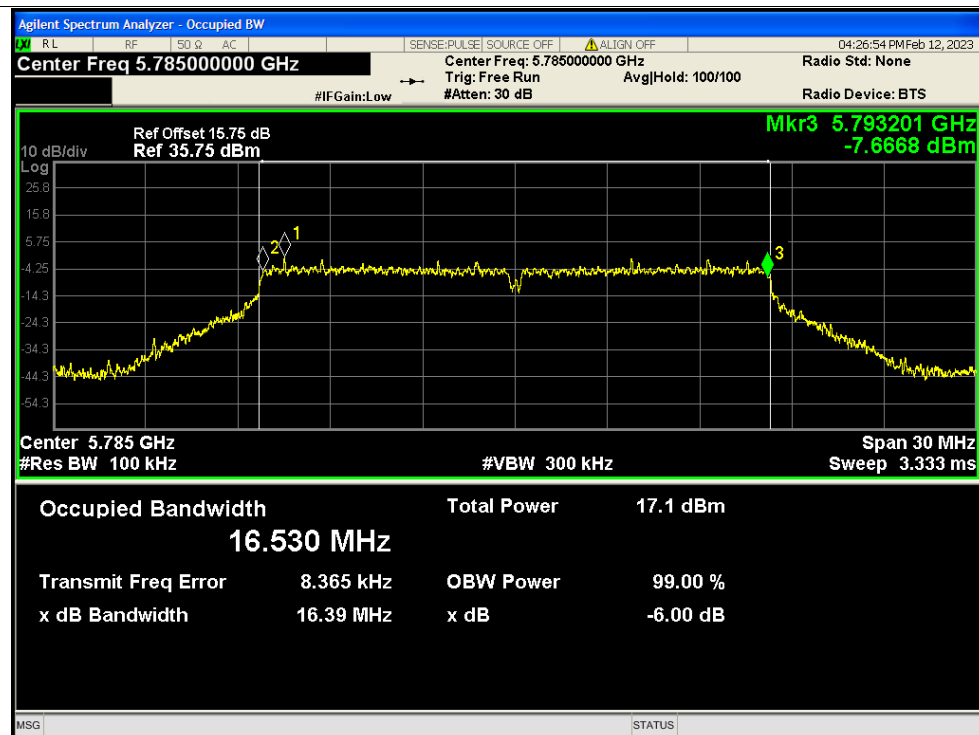


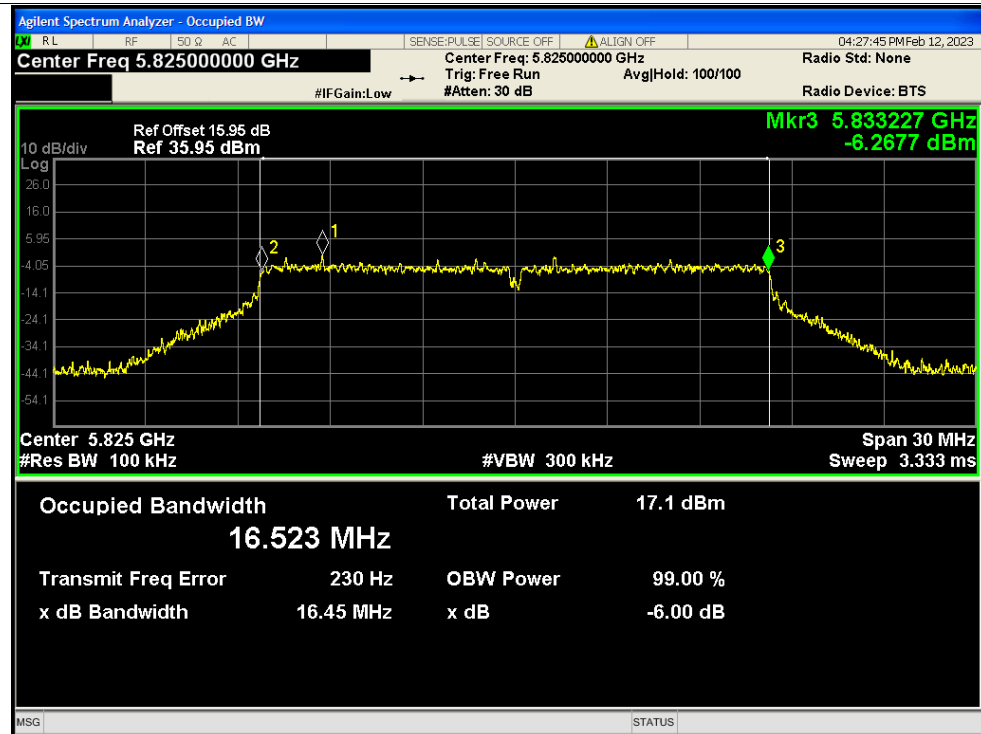
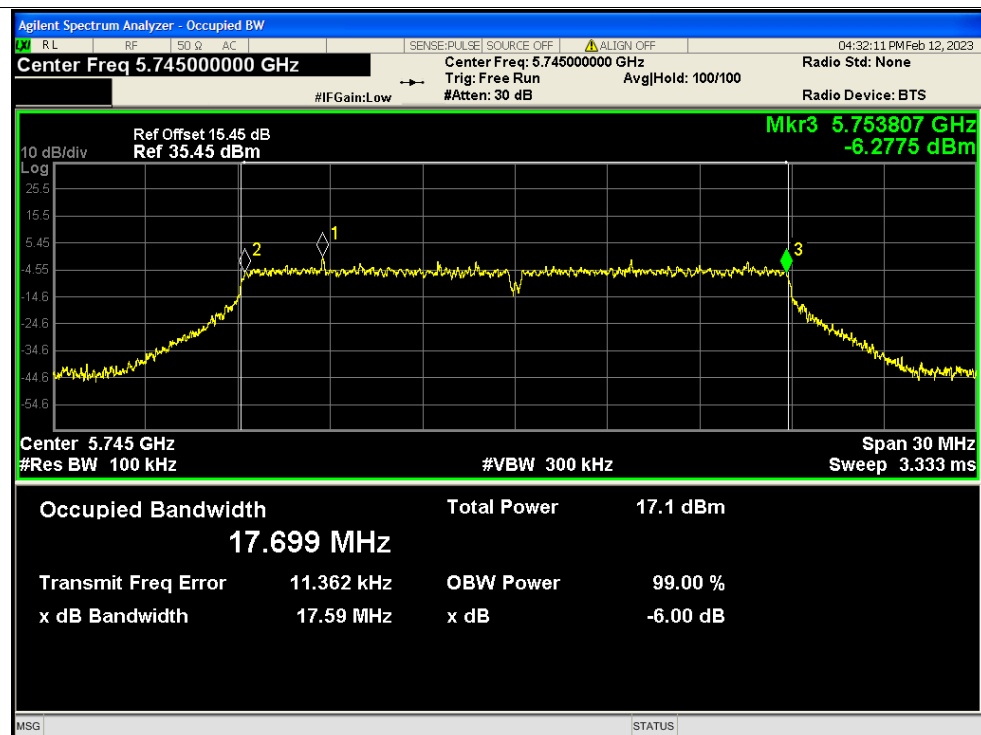
Test Graphs

-6dB Bandwidth NVNT a 5745MHz Ant1



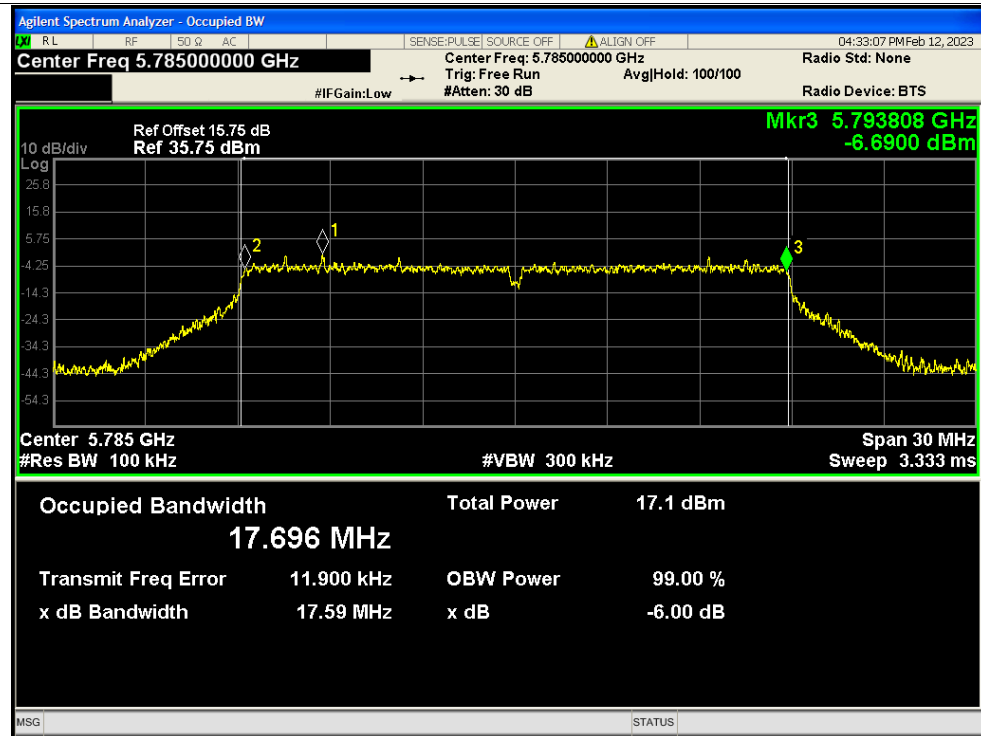
-6dB Bandwidth NVNT a 5785MHz Ant1



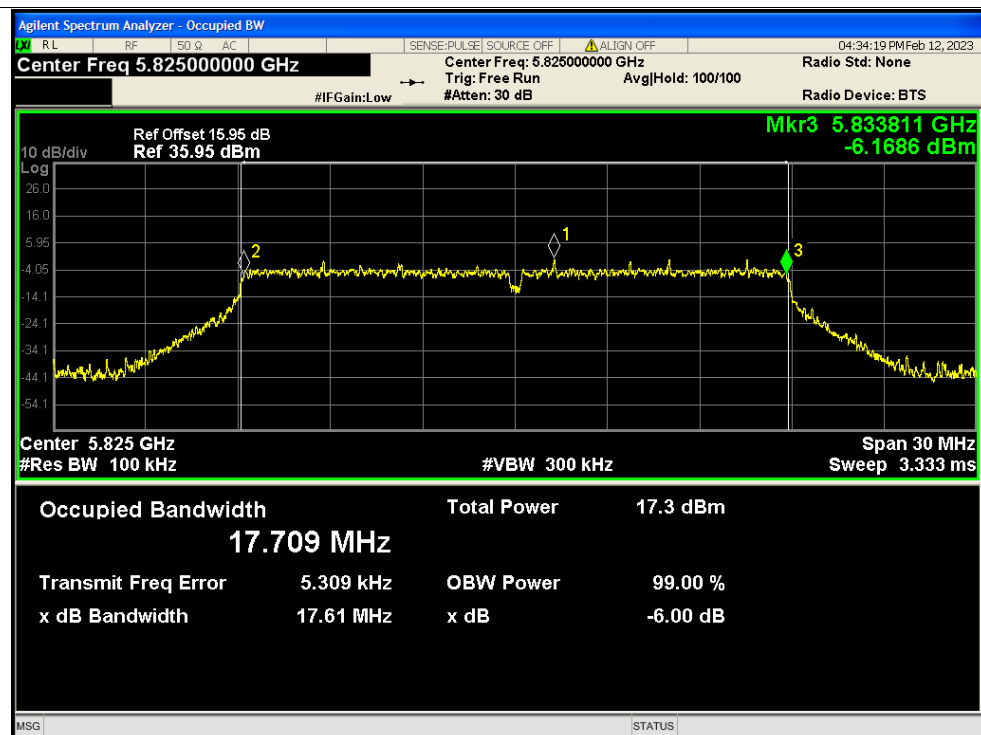
**-6dB Bandwidth NVNT a 5825MHz Ant1****-6dB Bandwidth NVNT n20 5745MHz Ant1**



-6dB Bandwidth NVNT n20 5785MHz Ant1

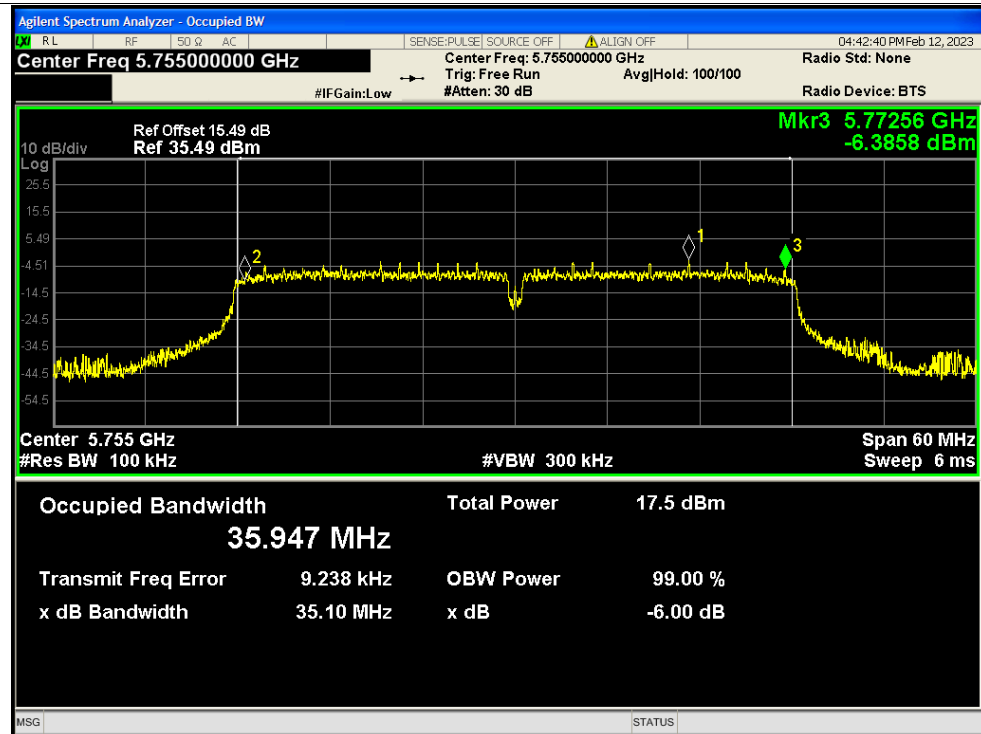


-6dB Bandwidth NVNT n20 5825MHz Ant1

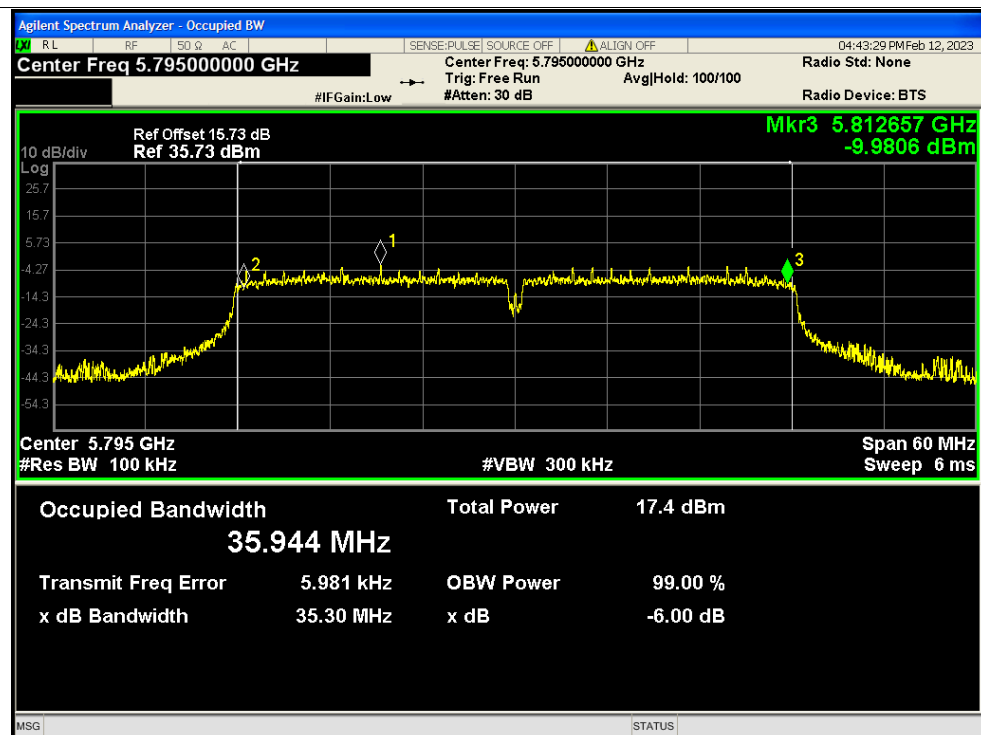




-6dB Bandwidth NVNT n40 5755MHz Ant1



-6dB Bandwidth NVNT n40 5795MHz Ant1



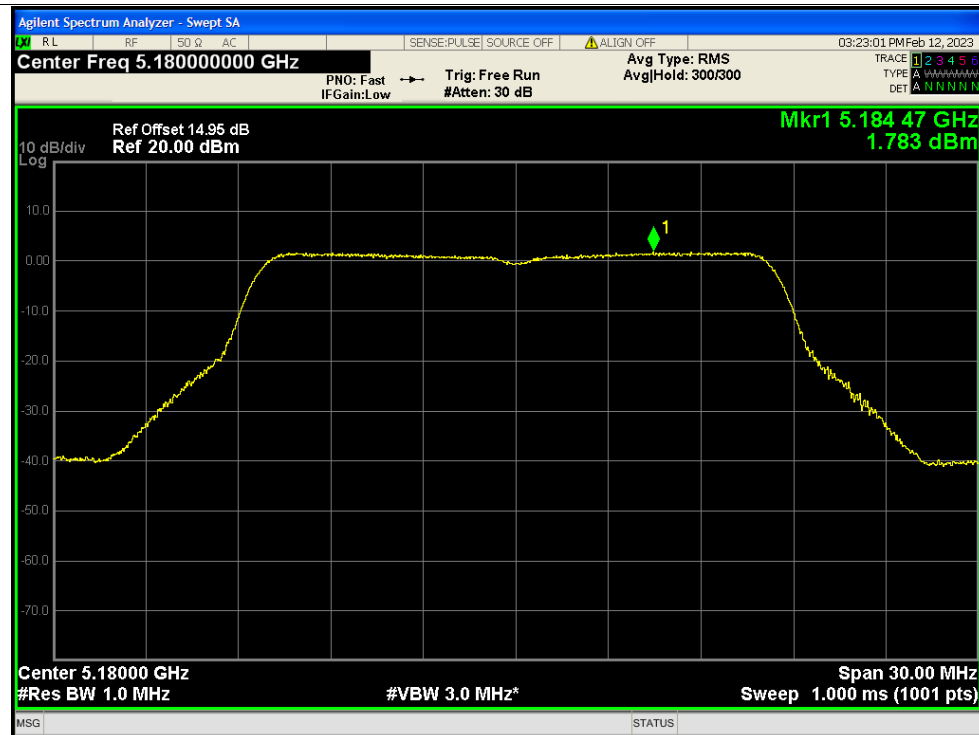
**A.4. Peak Power Spectral Density**

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm)	Duty Factor (dB)	Total PSD (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	Ant1	1.78	0.6	2.38	11	Pass
NVNT	a	5220	Ant1	1.42	0.6	2.02	11	Pass
NVNT	a	5240	Ant1	1.53	0.6	2.13	11	Pass
NVNT	a	5745	Ant1	-3.14	0.6	-2.54	30	Pass
NVNT	a	5785	Ant1	-3.29	0.6	-2.69	30	Pass
NVNT	a	5825	Ant1	-3.23	0.53	-2.70	30	Pass
NVNT	n20	5180	Ant1	0.79	0.63	1.42	11	Pass
NVNT	n20	5220	Ant1	0.52	0.63	1.15	11	Pass
NVNT	n20	5240	Ant1	0.92	0.64	1.56	11	Pass
NVNT	n20	5745	Ant1	-3.86	0.64	-3.22	30	Pass
NVNT	n20	5785	Ant1	-3.56	0.64	-2.92	30	Pass
NVNT	n20	5825	Ant1	-3.46	0.63	-2.83	30	Pass
NVNT	n40	5190	Ant1	-2.58	1.2	-1.38	11	Pass
NVNT	n40	5230	Ant1	-2.93	1.13	-1.80	11	Pass
NVNT	n40	5755	Ant1	-7.11	1.18	-5.93	30	Pass
NVNT	n40	5795	Ant1	-6.96	1.18	-5.78	30	Pass

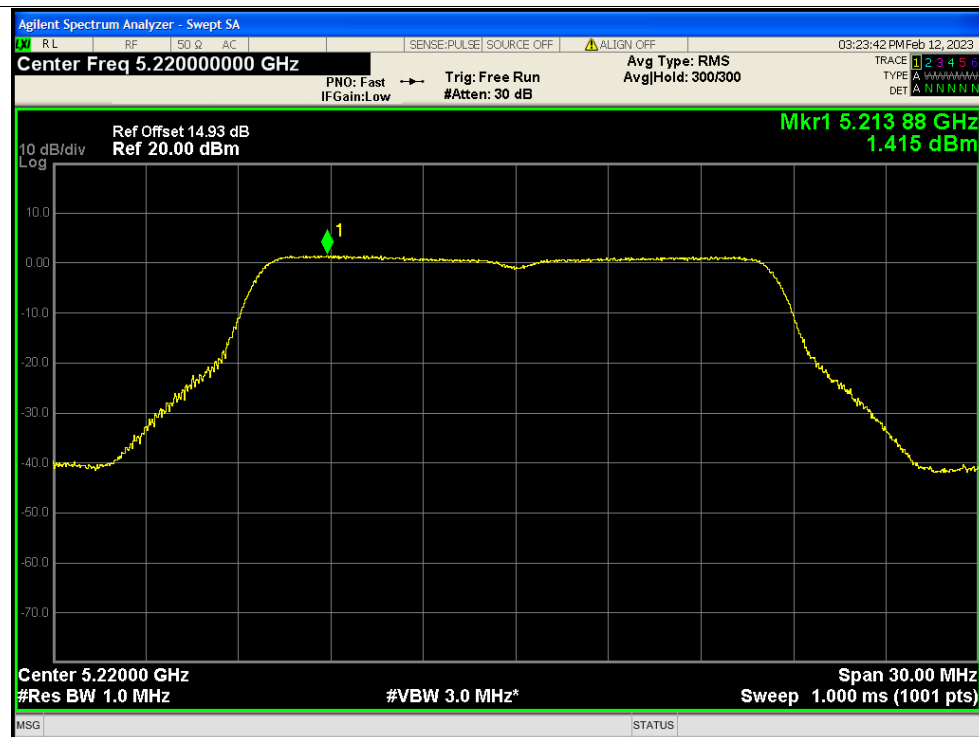


Test Graphs

PSD NVNT a 5180MHz Ant1

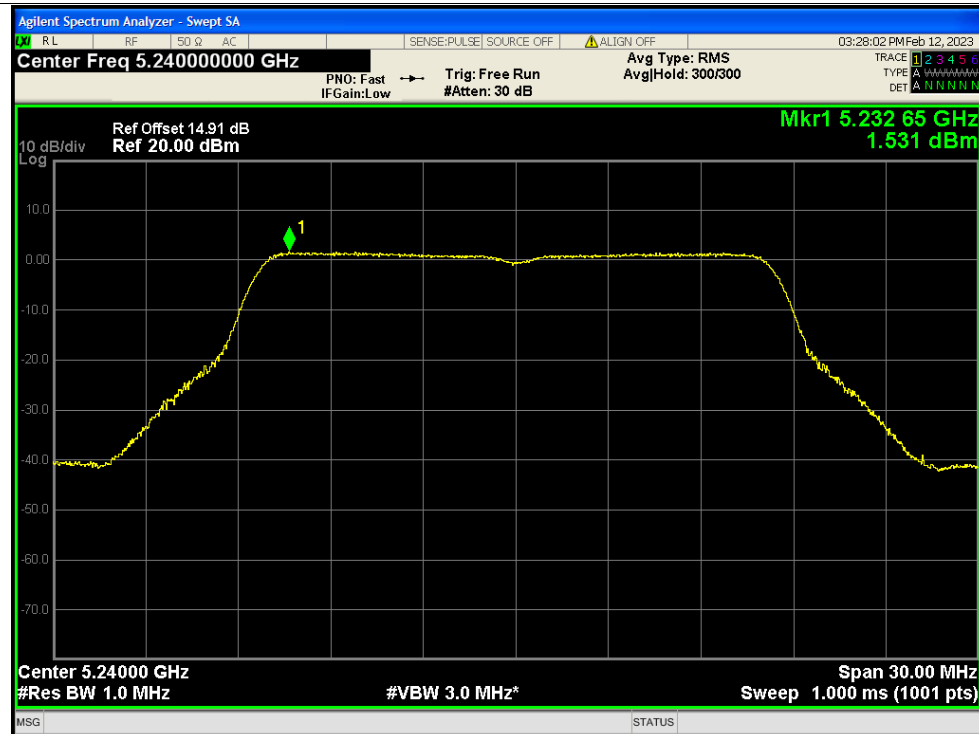


PSD NVNT a 5220MHz Ant1

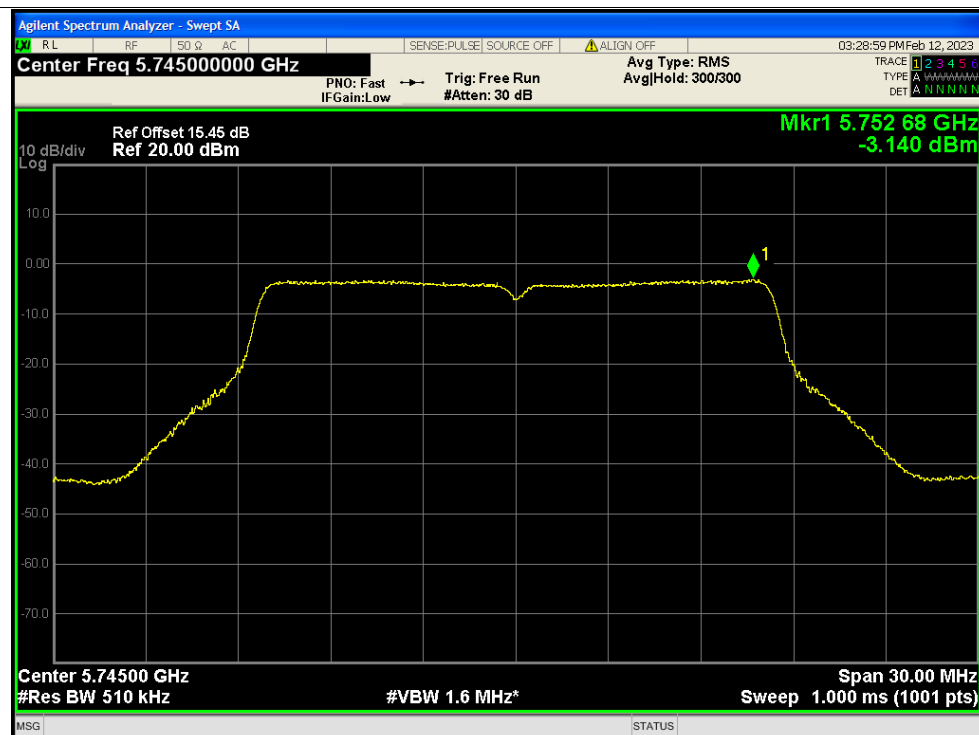




PSD NVNT a 5240MHz Ant1

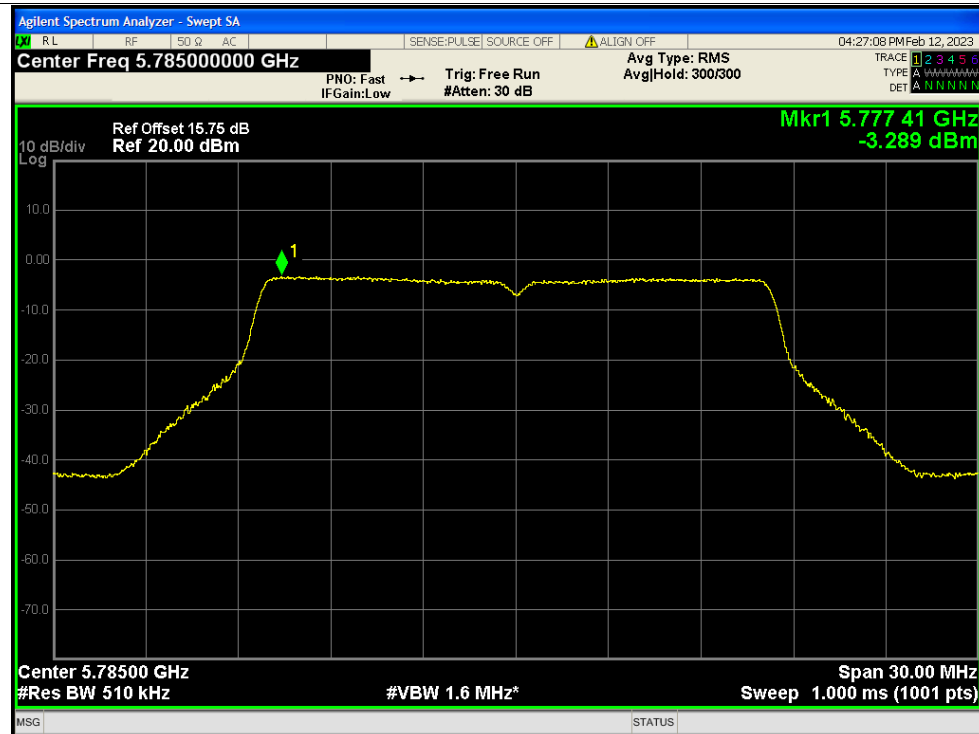


PSD NVNT a 5745MHz Ant1

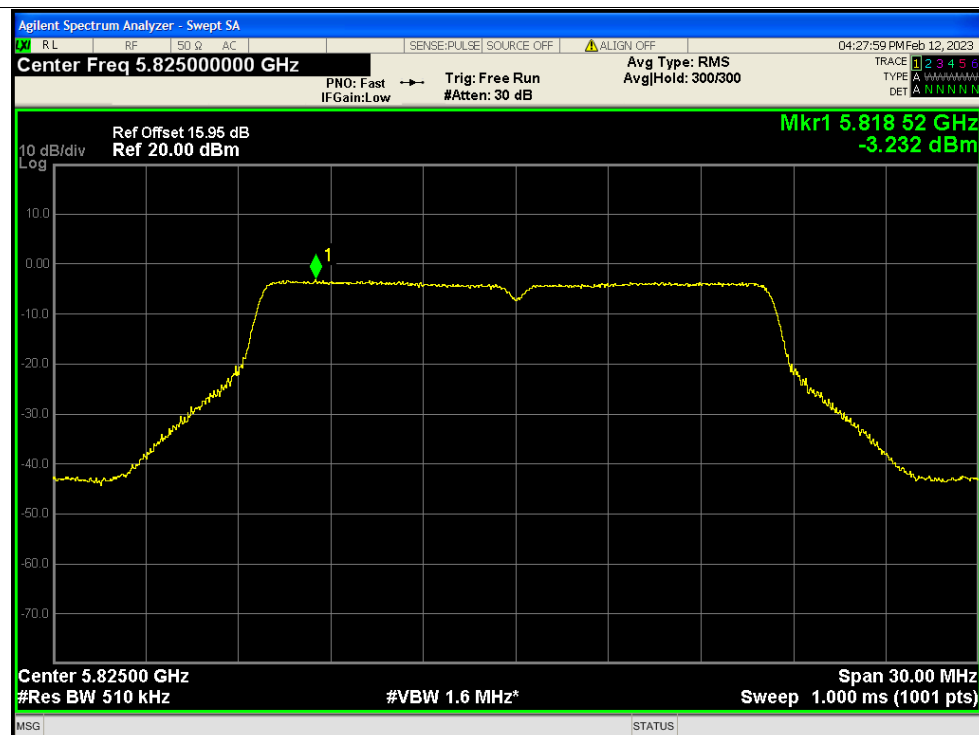




PSD NVNT a 5785MHz Ant1

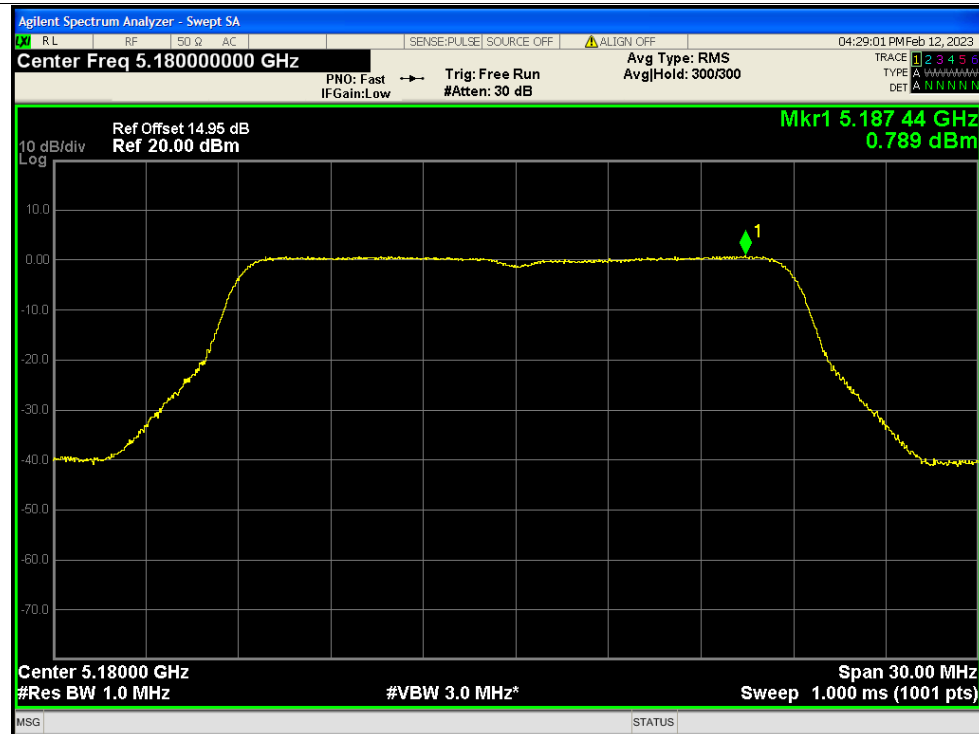


PSD NVNT a 5825MHz Ant1

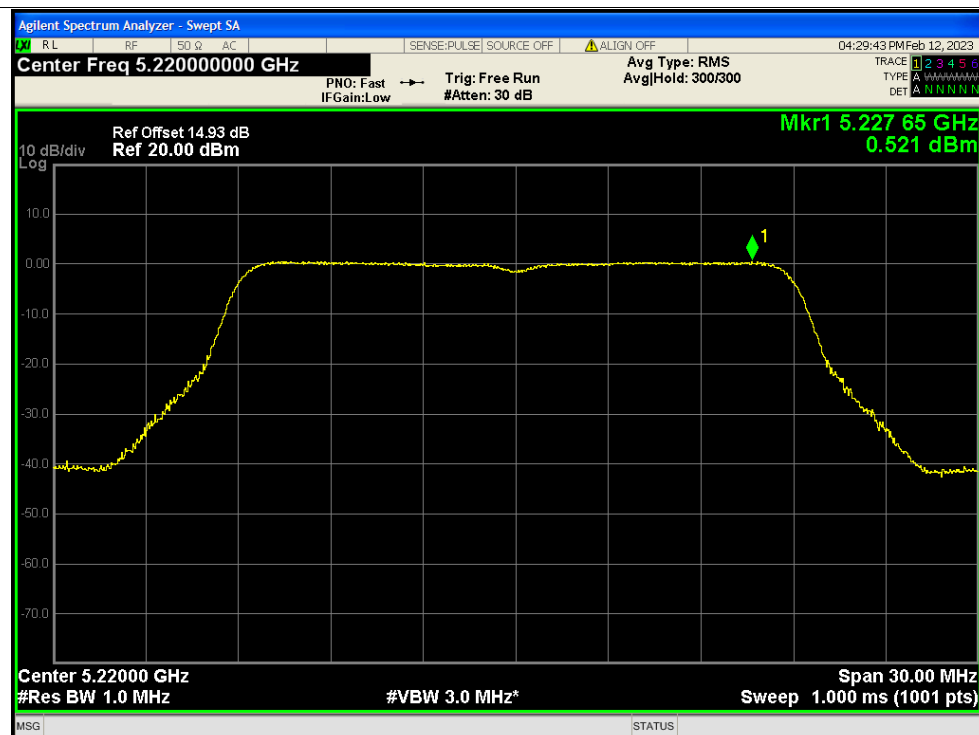




PSD NVNT n20 5180MHz Ant1

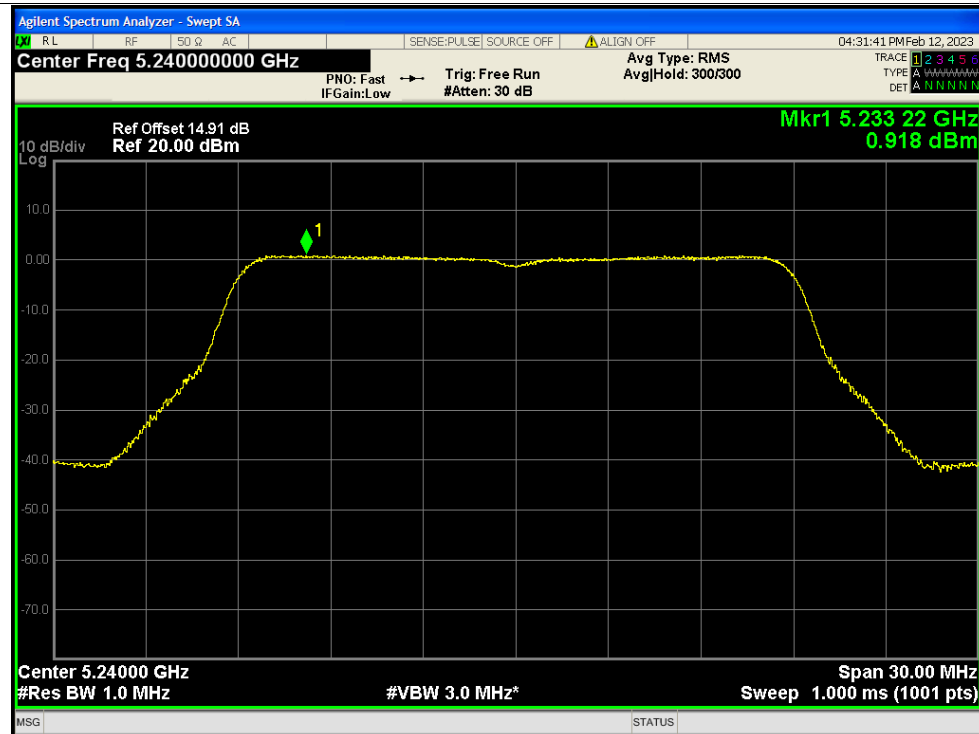


PSD NVNT n20 5220MHz Ant1

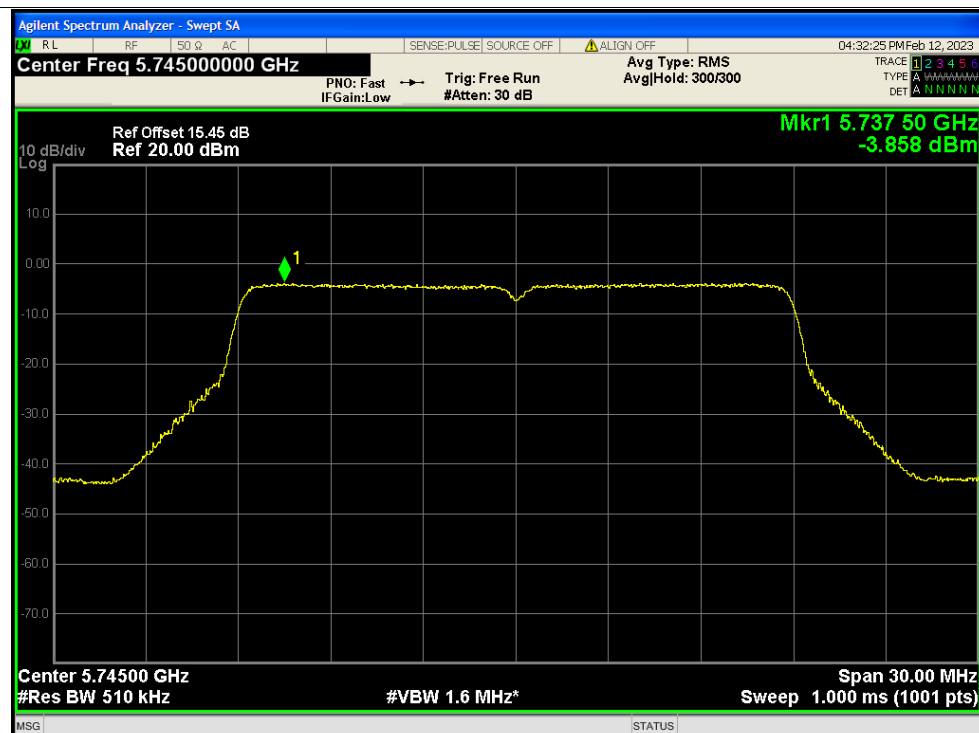




PSD NVNT n20 5240MHz Ant1

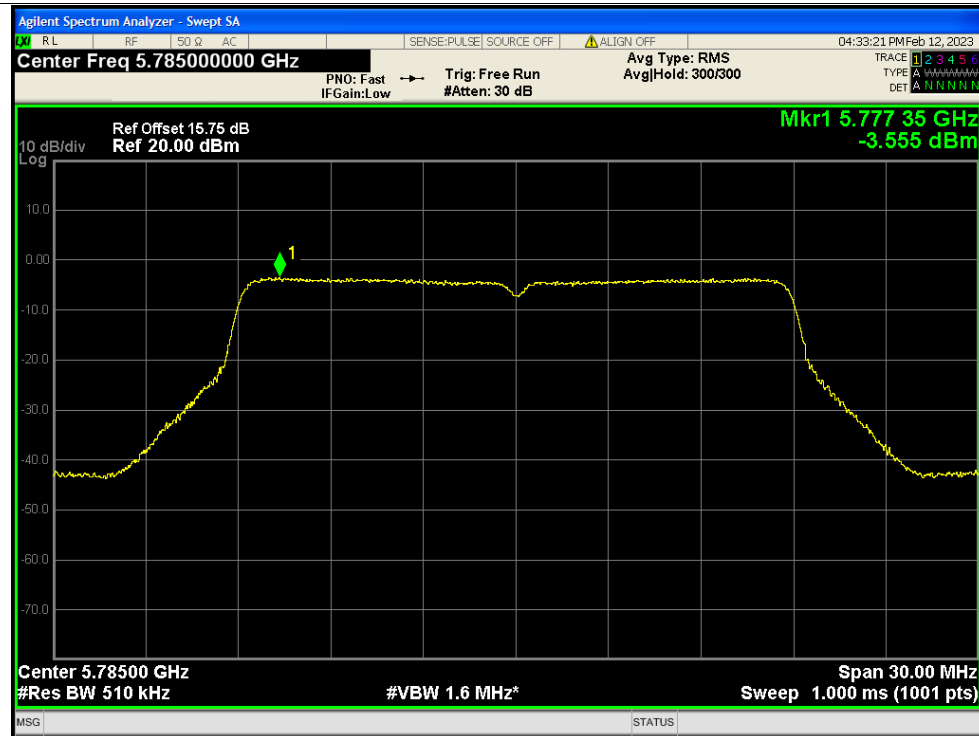


PSD NVNT n20 5745MHz Ant1

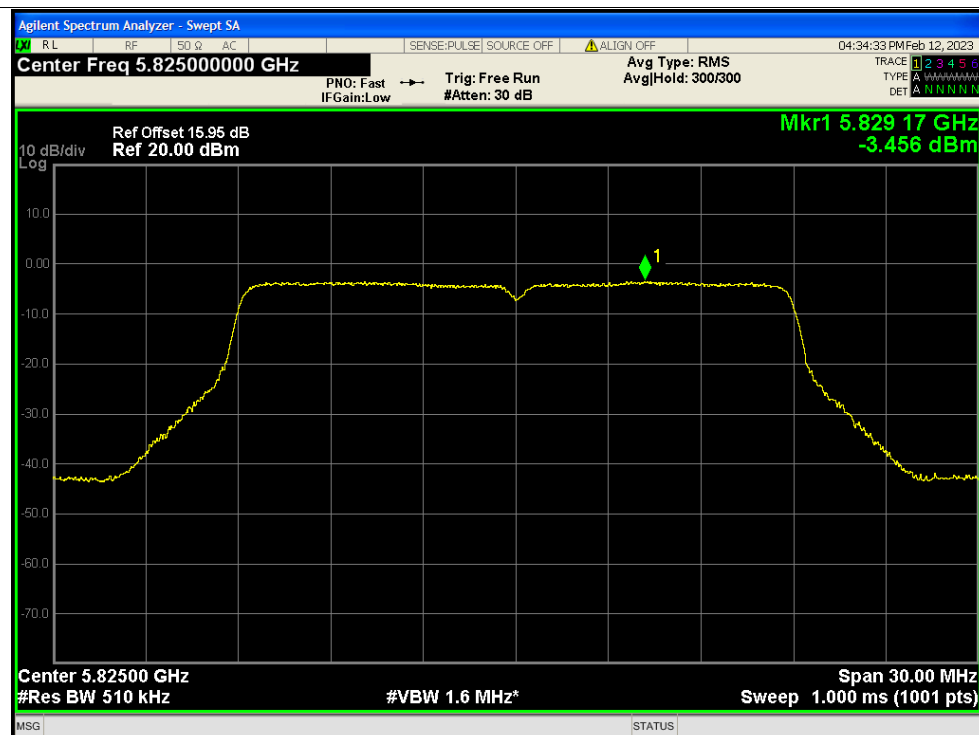




PSD NVNT n20 5785MHz Ant1

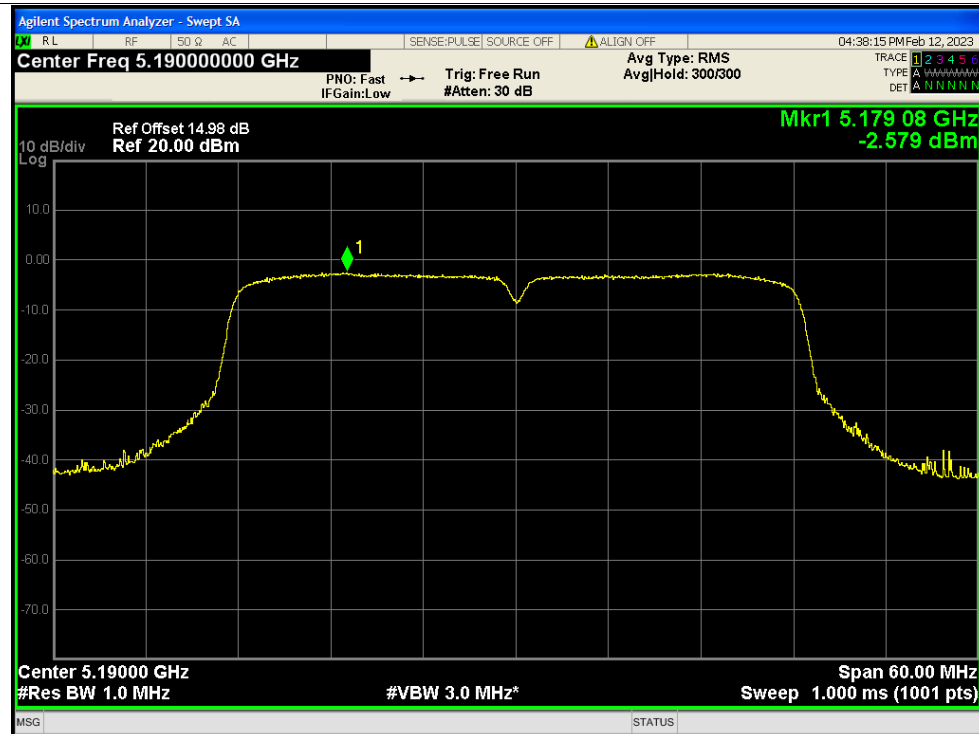


PSD NVNT n20 5825MHz Ant1

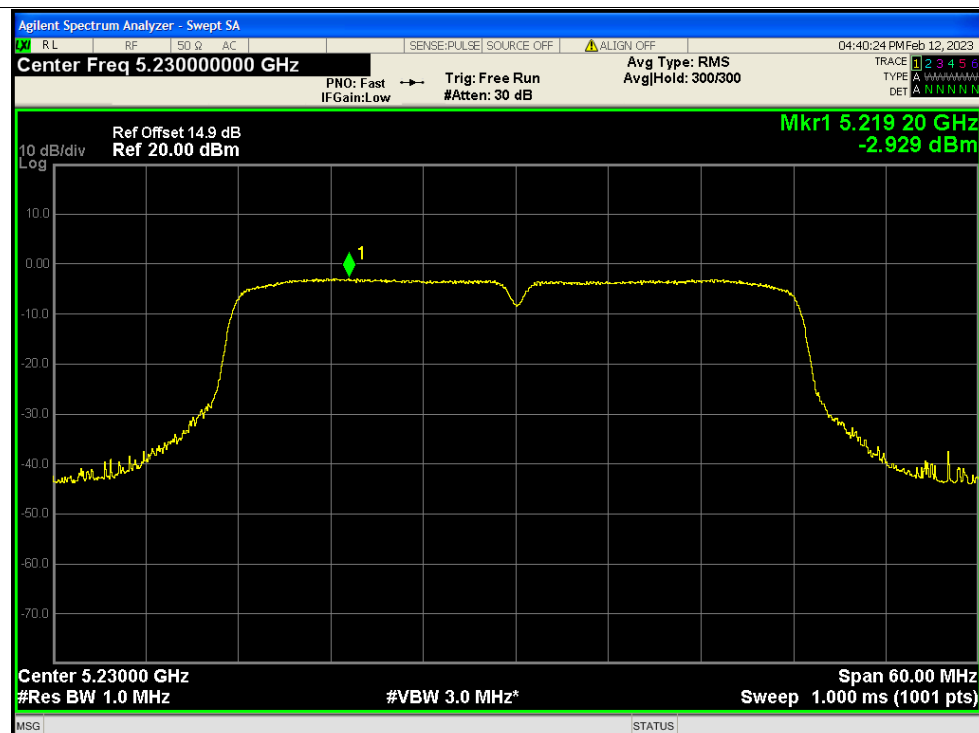




PSD NVNT n40 5190MHz Ant1

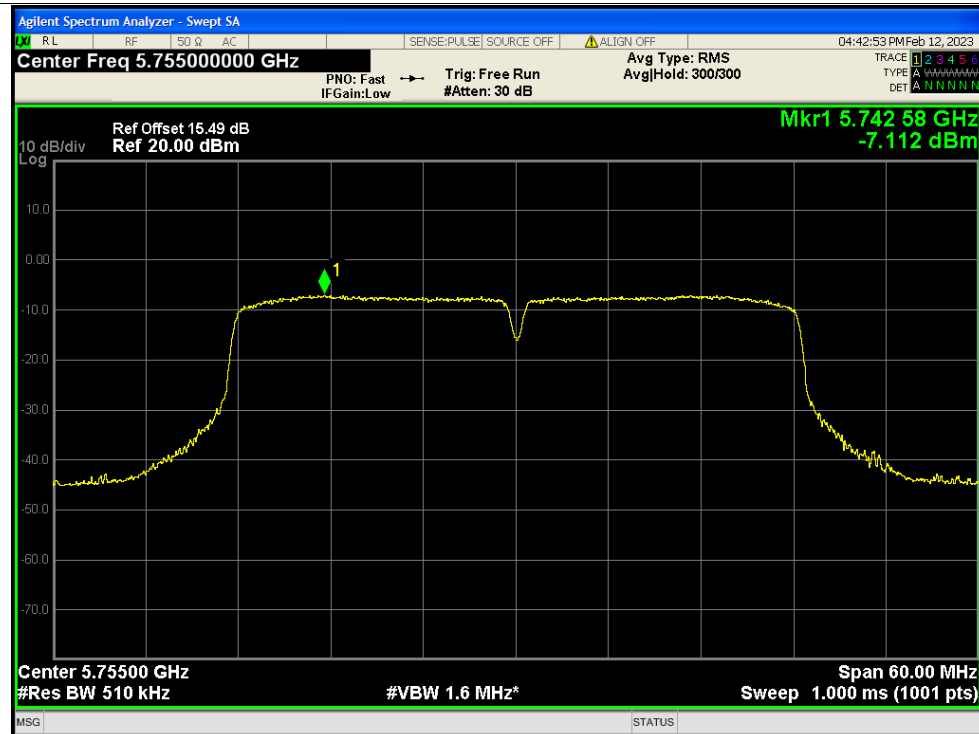


PSD NVNT n40 5230MHz Ant1

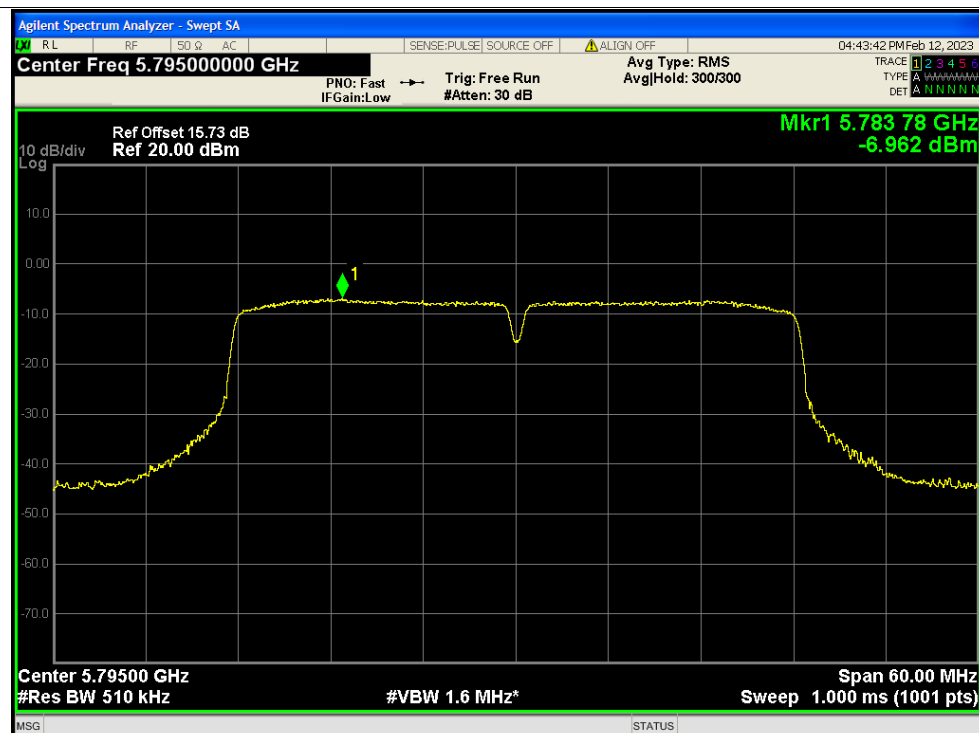




PSD NVNT n40 5755MHz Ant1



PSD NVNT n40 5795MHz Ant1



**A.5. Frequency Stability**

Condition	Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
20C 3V	Carrier	5180	Ant1	5179.993	-7000	-1.35	25	Pass
20C 3.85V	Carrier	5180	Ant1	5179.993	-7000	-1.35	25	Pass
20C 4.4V	Carrier	5180	Ant1	5179.993	-7000	-1.35	25	Pass
0C 3.85V	Carrier	5180	Ant1	5179.993	-7000	-1.35	25	Pass
10C 3.85V	Carrier	5180	Ant1	5179.993	-7000	-1.35	25	Pass
30C 3.85V	Carrier	5180	Ant1	5179.993	-7000	-1.35	25	Pass
45C 3.85V	Carrier	5180	Ant1	5179.993	-7000	-1.35	25	Pass
20C 3V	Carrier	5745	Ant1	5744.993	-7000	-1.22	25	Pass
20C 3.85V	Carrier	5745	Ant1	5744.993	-7000	-1.22	25	Pass
20C 4.4V	Carrier	5745	Ant1	5744.993	-7000	-1.22	25	Pass
0C 3.85V	Carrier	5745	Ant1	5744.993	-7000	-1.22	25	Pass
10C 3.85V	Carrier	5745	Ant1	5744.993	-7000	-1.22	25	Pass
30C 3.85V	Carrier	5745	Ant1	5744.993	-7000	-1.22	25	Pass
45C 3.85V	Carrier	5745	Ant1	5744.993	-7000	-1.22	25	Pass



A.6. Conducted Emission

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Set RBW=9kHz, VBW=30kHz. Refer to recorded points and plots below.

Note: Both of the test voltage AC 120V/60Hz and AC 230V/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

A. Test Setup:

Test Mode: EUT + Adapter + USB Cable + WIFI TX

Test voltage: AC 120V/60Hz

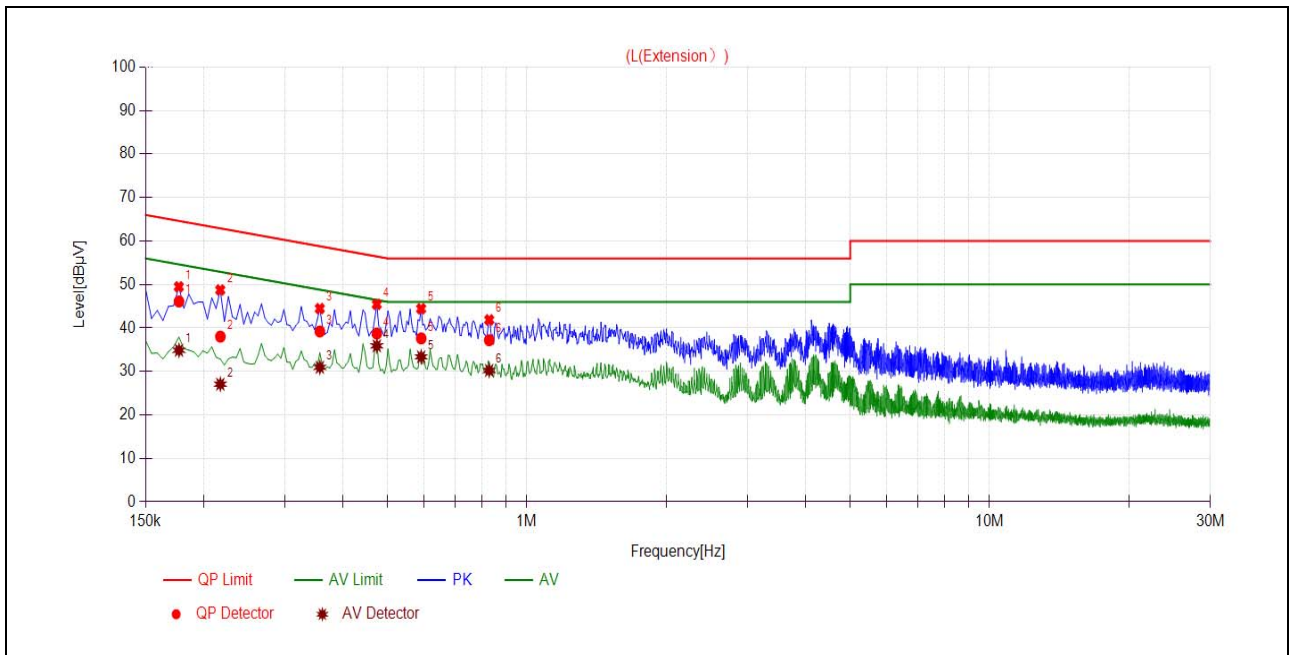
The measurement results are obtained as below:

$$E \text{ [dB}\mu\text{V]} = U_R + L_{\text{Cable loss}} \text{ [dB]} + A_{\text{Factor}}$$

U_R : Receiver Reading

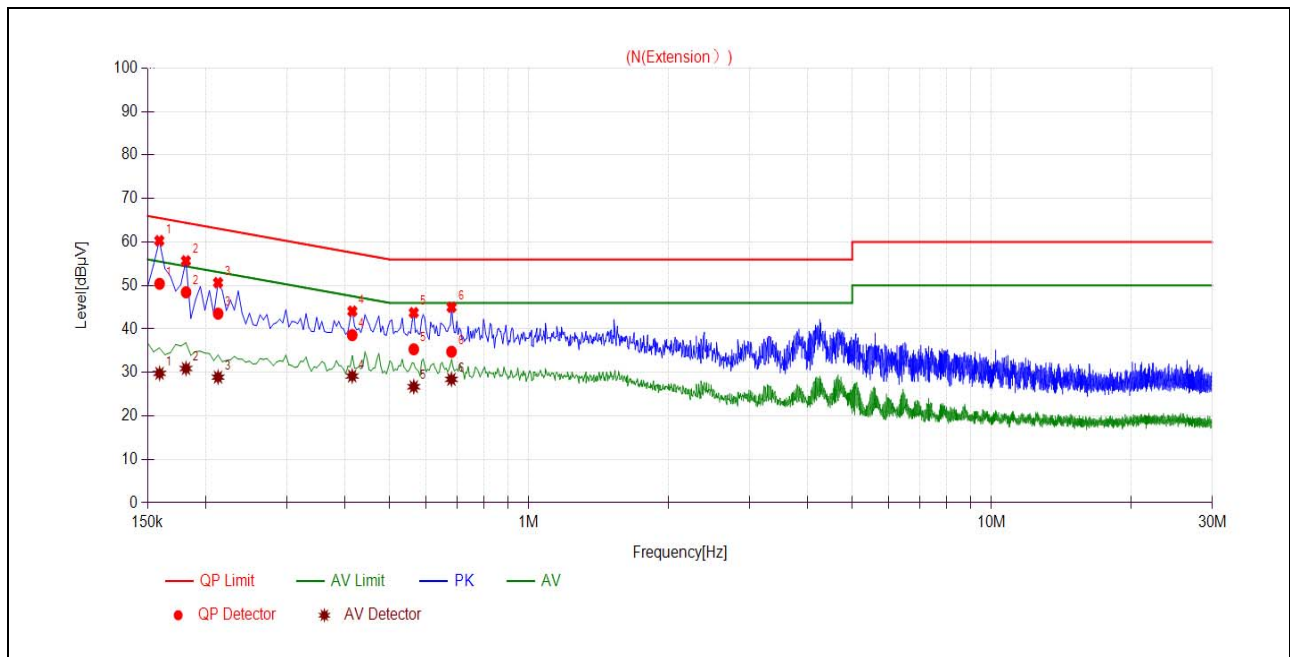
A_{Factor} : Voltage division factor of LISN

B. Test Plot:



(L Phase)

No.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1771	46.09	34.86	64.62	54.62	Line	PASS
2	0.2176	38.02	27.06	62.91	52.91		PASS
3	0.3570	39.20	30.94	58.80	48.80		PASS
4	0.4740	38.71	35.88	56.44	46.44		PASS
5	0.5911	37.61	33.35	56.00	46.00		PASS
6	0.8291	37.18	30.23	56.00	46.00		PASS



(N Phase)

No.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1592	50.40	29.79	65.51	55.51	Neutral	PASS
2	0.1816	48.43	30.90	64.41	54.41		PASS
3	0.2130	43.53	28.91	63.09	53.09		PASS
4	0.4152	38.59	29.18	57.54	47.54		PASS
5	0.5640	35.33	26.72	56.00	46.00		PASS
6	0.6804	34.76	28.41	56.00	46.00		PASS



A.7. Restricted Frequency Bands

The lowest and highest channels are tested to verify the Restricted Frequency Bands.

The measurement results are obtained as below:

$$E [\text{dB}\mu\text{V/m}] = U_R + A_T + A_{\text{Factor}} [\text{dB}]; A_T = L_{\text{Cable loss}} [\text{dB}] - G_{\text{preamp}} [\text{dB}]$$

A_T : Total correction Factor except Antenna

U_R : Receiver Reading

G_{preamp} : Preamplifier Gain

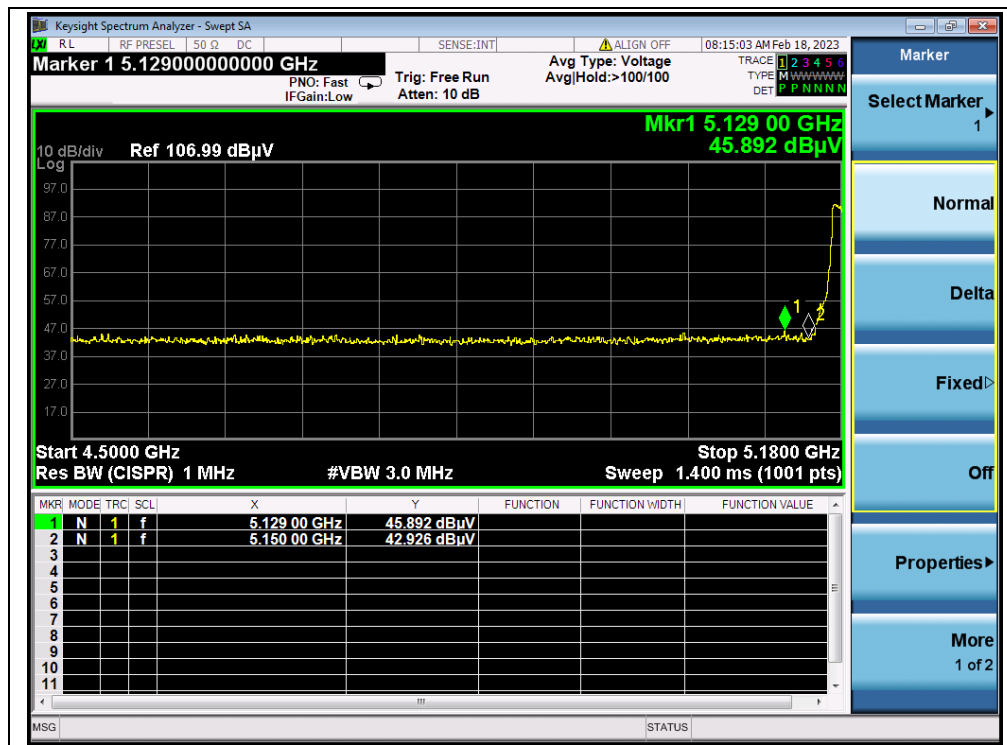
A_{Factor} : Antenna Factor at 3m

Note 1: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

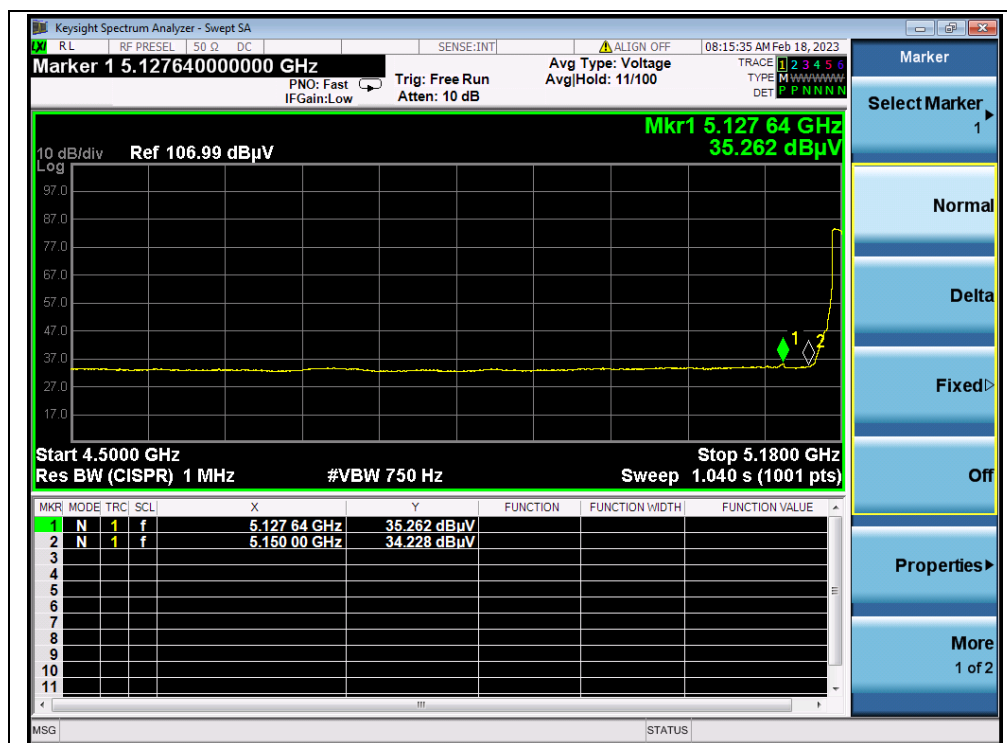
Note 2 All test modes and bandwidth were considered and evaluated respectively by performing full test, only the worst data were recorded for each bandwidth.

802.11a Mode

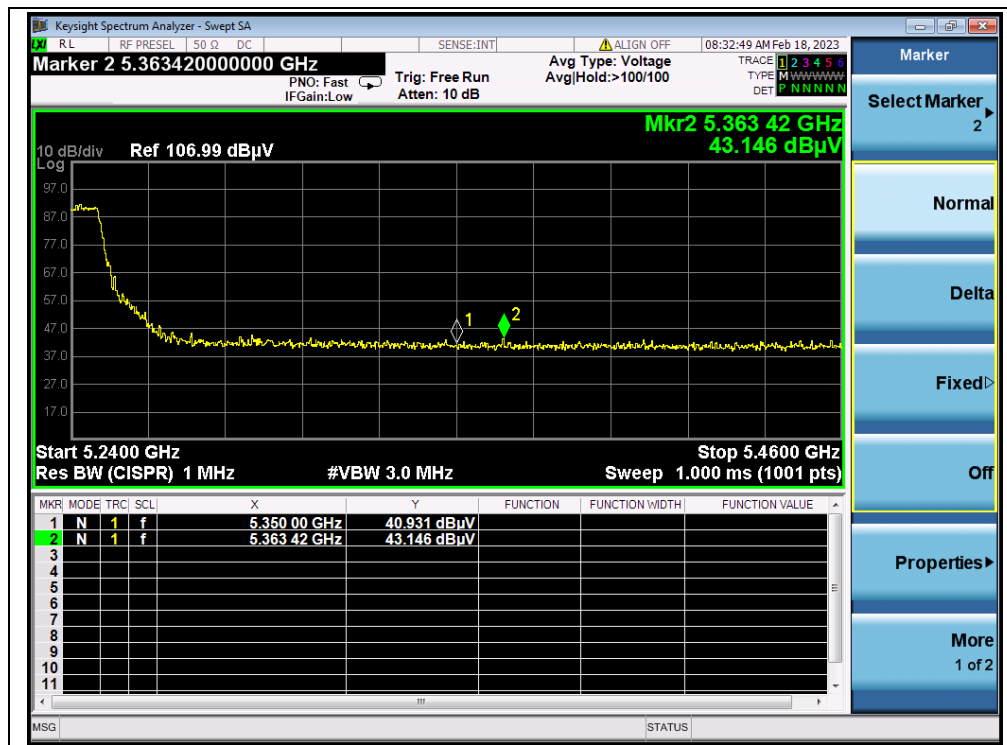
Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dB μ V)	A_T (dB)	A_{Factor} (dB@ 3m)	Max. Emission E (dB μ V/m)	Limit (dB μ V/ m)	Verdict
		PK/ AV						
36	5129.00	PK	45.89	-19.54	32.20	58.55	74	PASS
36	5127.64	AV	35.26	-19.54	32.20	47.92	54	PASS
48	5363.42	PK	43.15	-19.54	32.20	55.81	74	PASS
48	5350.00	AV	31.62	-19.54	32.20	44.28	54	PASS
149	5725.00	PK	52.36	-19.01	32.20	65.55	122.23	PASS
165	5850.00	PK	43.09	-19.01	32.20	56.28	122.23	PASS



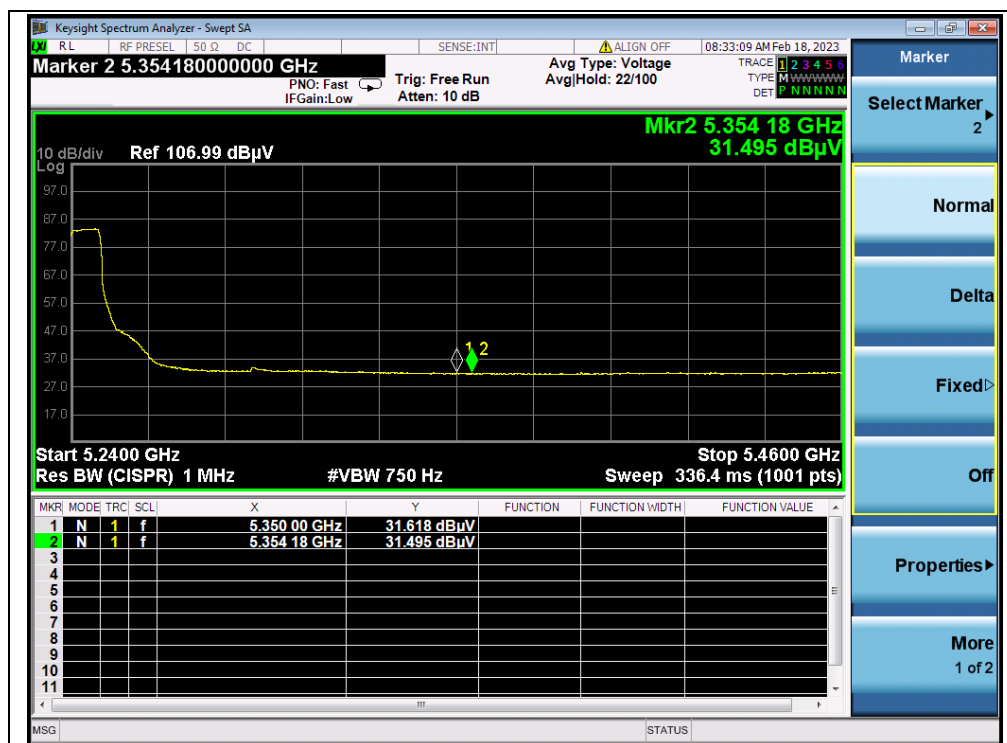
(PEAK, Channel 36, 802.11a)



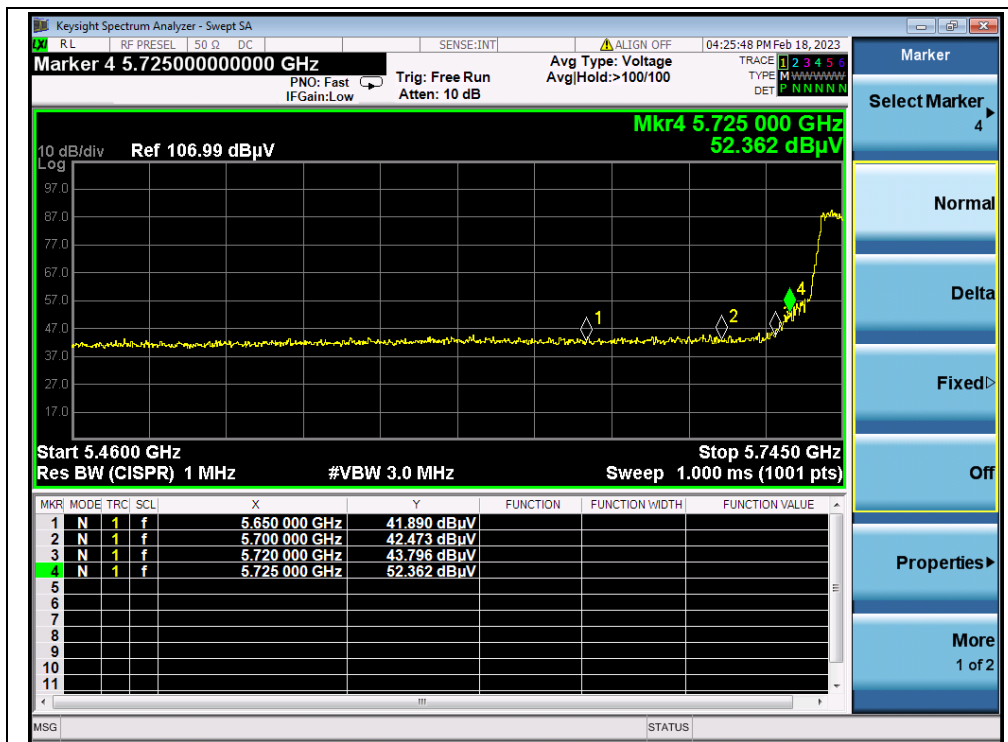
(AVERAGE, Channel 36, 802.11a)



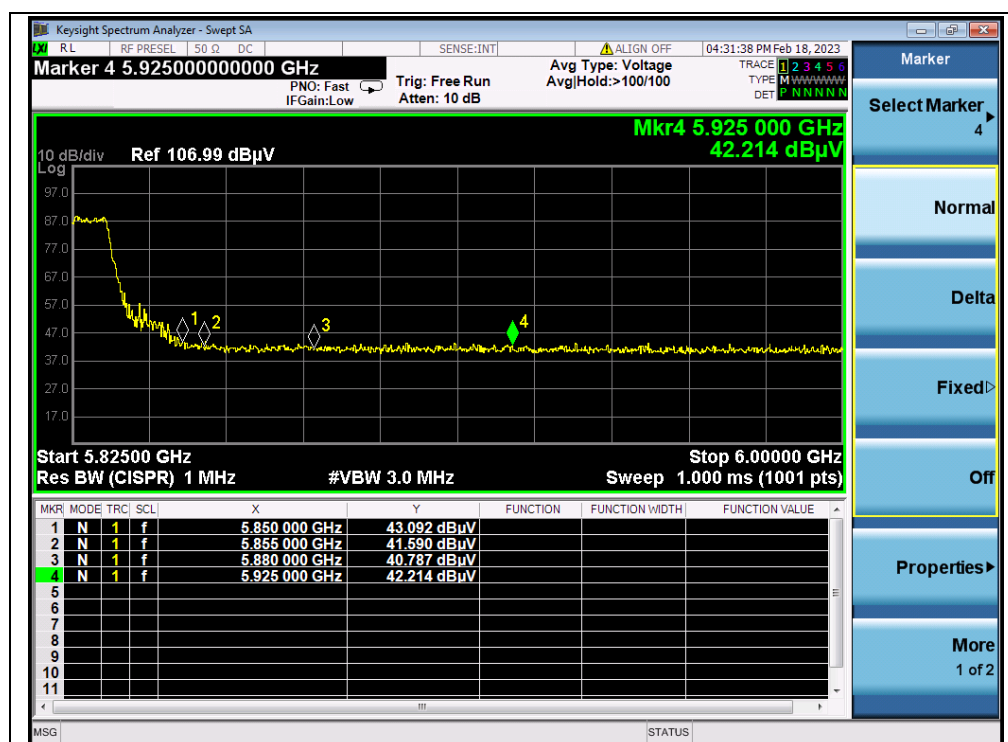
(PEAK, Channel 48, 802.11a)



(AVERAGE, Channel 48, 802.11a)



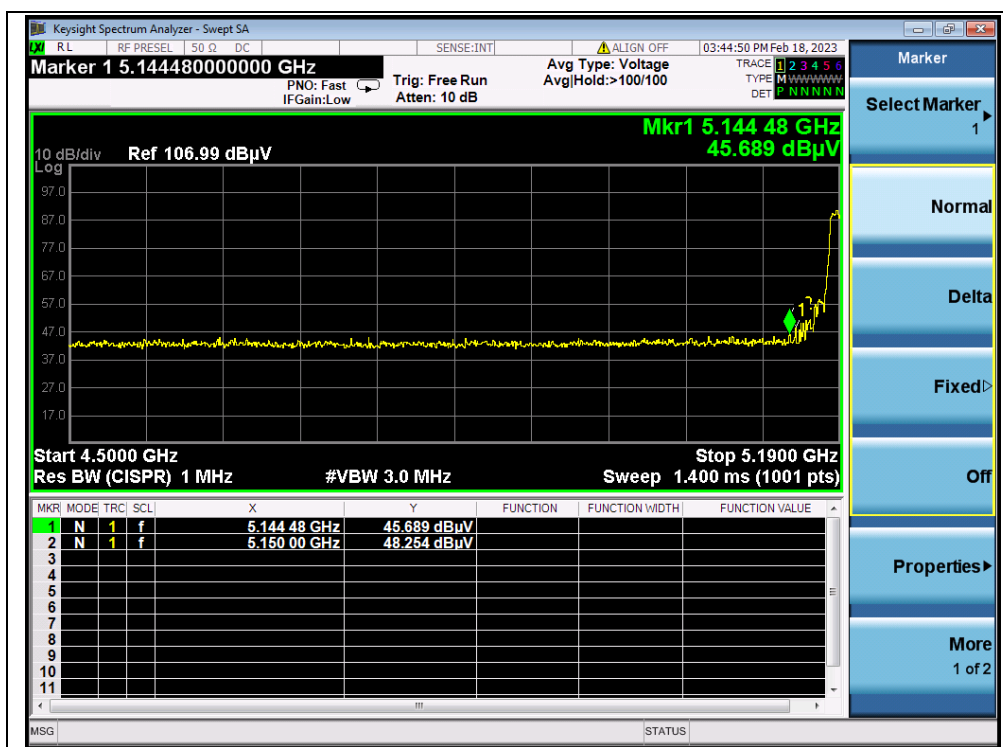
(PEAK, Channel 149, 802.11a)



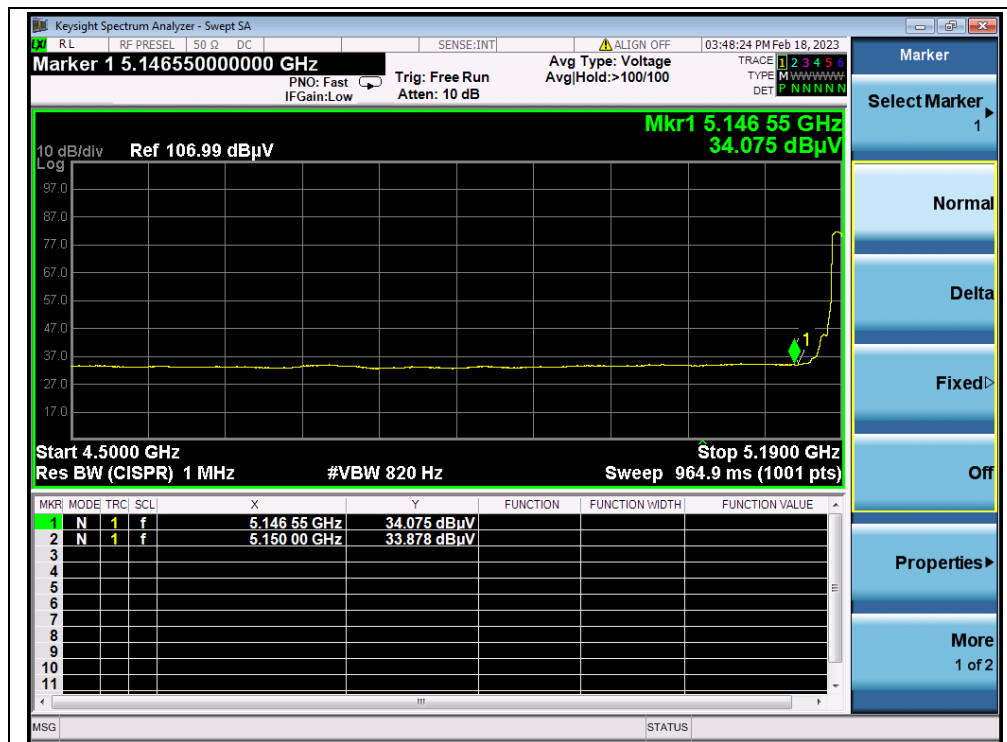
(PEAK, Channel 165, 802.11a)



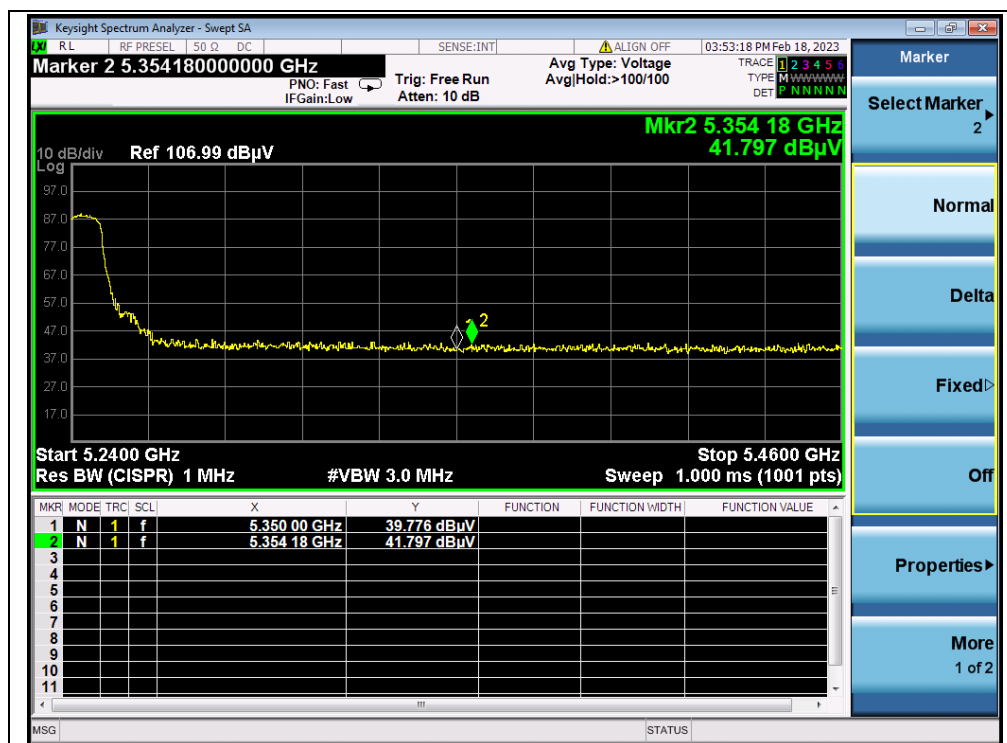
Channel	Frequency (MHz)	Detector	Receiver Reading U _R (dBμV)	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
38	5150.00	PK	48.25	-19.54	32.20	60.91	74	PASS
38	5146.55	AV	34.08	-19.54	32.20	46.74	54	PASS
46	5354.18	PK	41.80	-19.54	32.20	54.46	74	PASS
46	5351.98	AV	32.03	-19.54	32.20	44.69	54	PASS
151	5725.00	PK	44.23	-19.01	32.20	57.42	122.23	PASS
159	5925.00	PK	44.53	-19.01	32.20	57.72	68.23	PASS



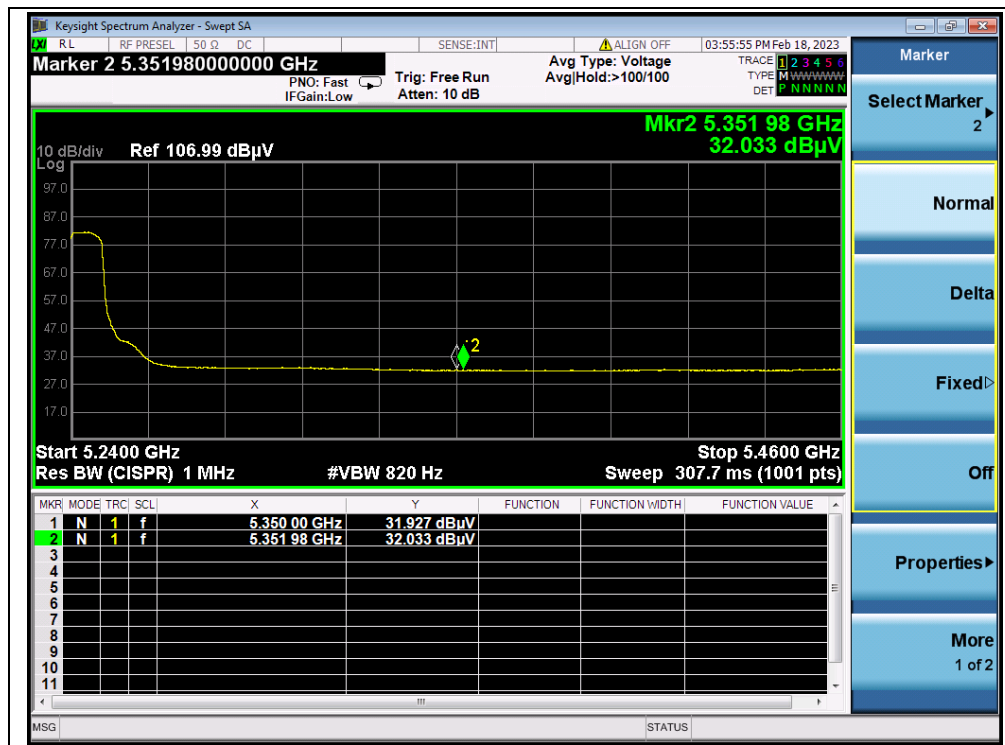
(PEAK, Channel 38, 802.11n (HT40))



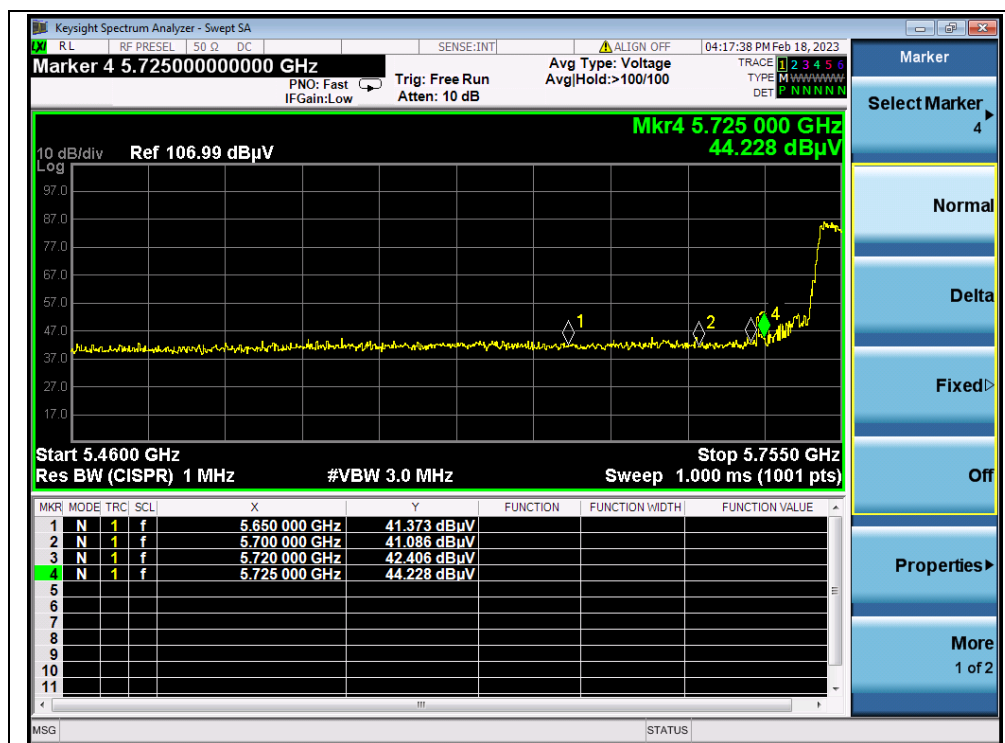
(AVERAGE, Channel 38, 802.11n (HT40))



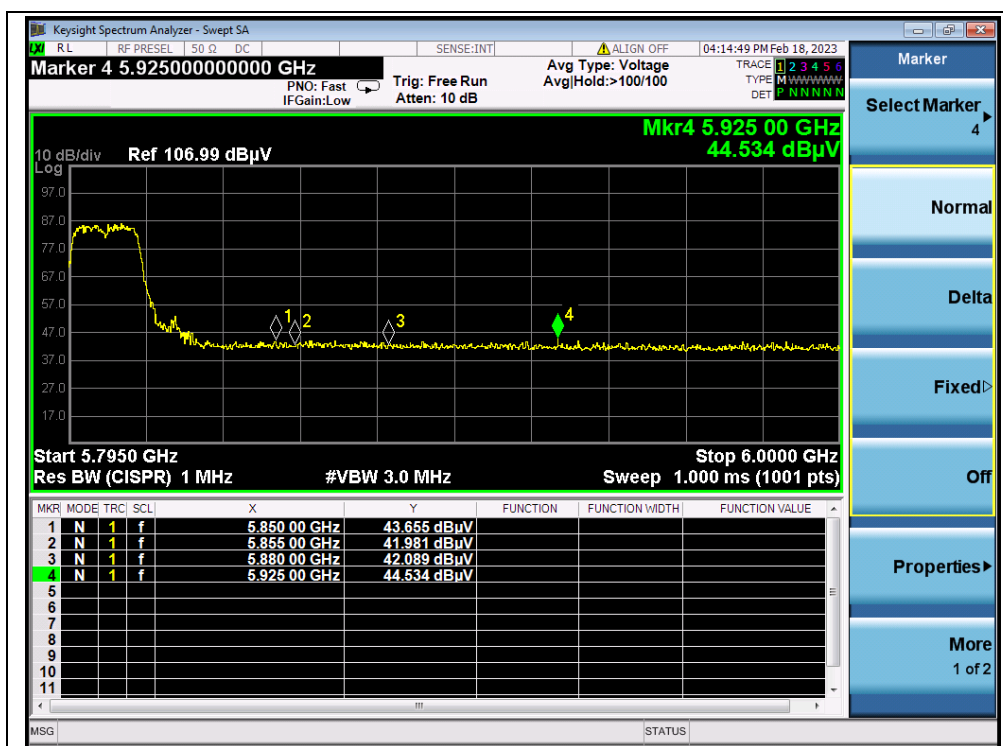
(PEAK, Channel 48, 802.11n (HT40))



(AVERAGE, Channel 48, 802.11n (HT40))



(PEAK, Channel 151, 802.11n (HT40))



(PEAK, Channel 159, 802.11n (HT40))



A.8. Radiated Emission

According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak (or average) limit, it is unnecessary to perform an quasi-peak measurement (or average).

The measurement results are obtained as below:

$$E [\text{dB}\mu\text{V/m}] = U_R + A_T + A_{\text{Factor}} [\text{dB}]; A_T = L_{\text{Cable loss}} [\text{dB}] - G_{\text{preamp}} [\text{dB}]$$

A_T : Total correction Factor except Antenna

U_R : Receiver Reading

G_{preamp} : Preamplifier Gain

A_{Factor} : Antenna Factor at 3m

During the test, the total correction Factor A_T and A_{Factor} were built in test software.

Note1: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

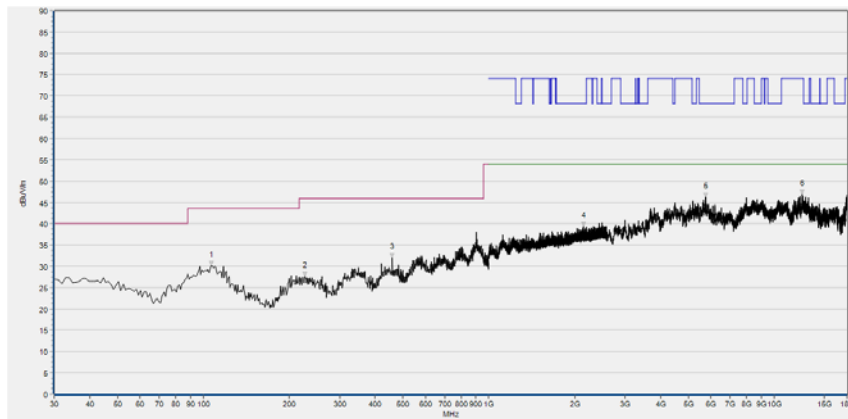
Note2: For the frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

Note3: For the frequency, which started from 18GHz to 10th harmonic of the highest frequency, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

Note 4: All test modes and bandwidth were considered and evaluated respectively by performing full test, only the worst data were recorded for each bandwidth.

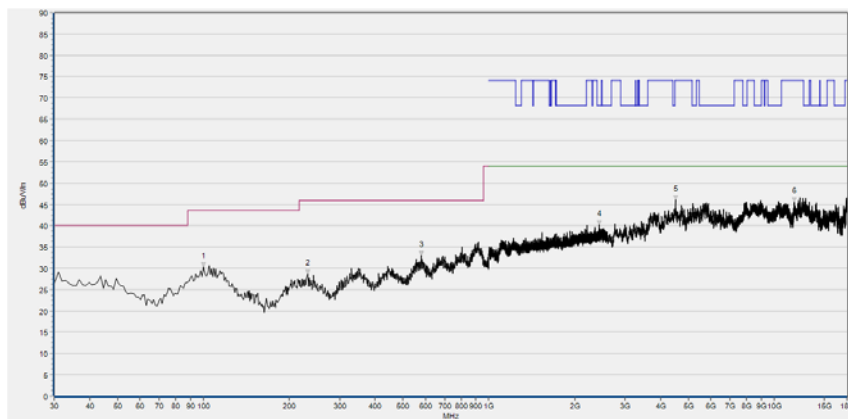
**802.11a Mode**

Plot for Channel 36



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
106.707	30.16	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
226.136	27.65	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
459.169	31.97	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2142.247	39.32	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
5751.470	46.19	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12504.181	46.94	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

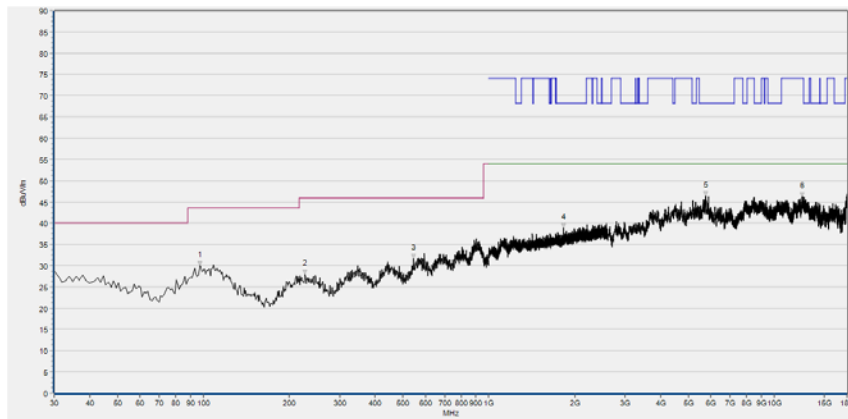
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
99.910	30.31	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
231.962	28.58	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
578.599	33.09	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2442.081	40.17	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
4503.821	46.01	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11752.511	45.58	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

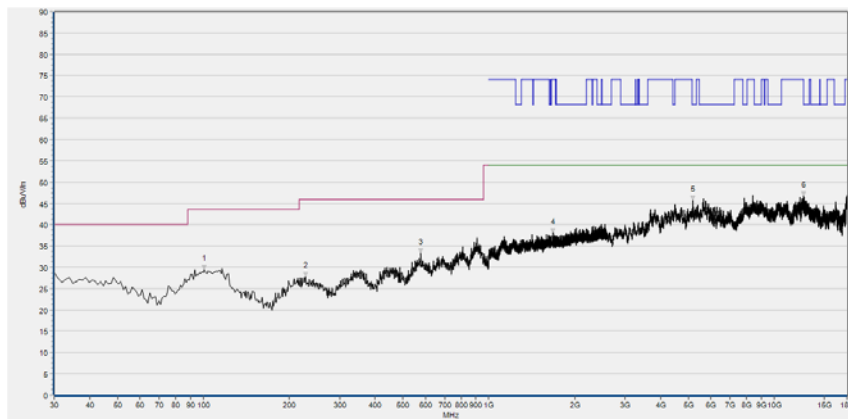
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 44



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
96.997	29.93	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
227.107	28.00	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
544.615	31.65	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1825.342	38.90	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
5757.632	46.38	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12522.665	46.24	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

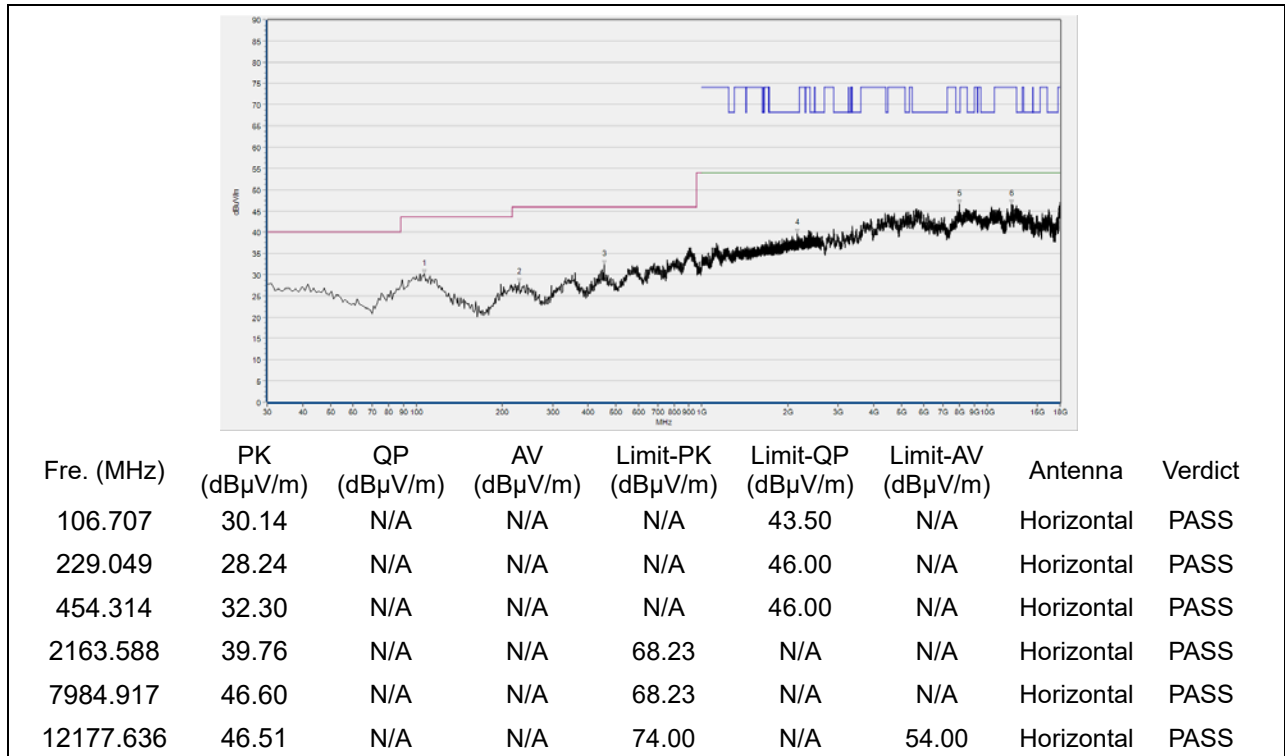
(Antenna Horizontal, 30MHz to 18GHz)



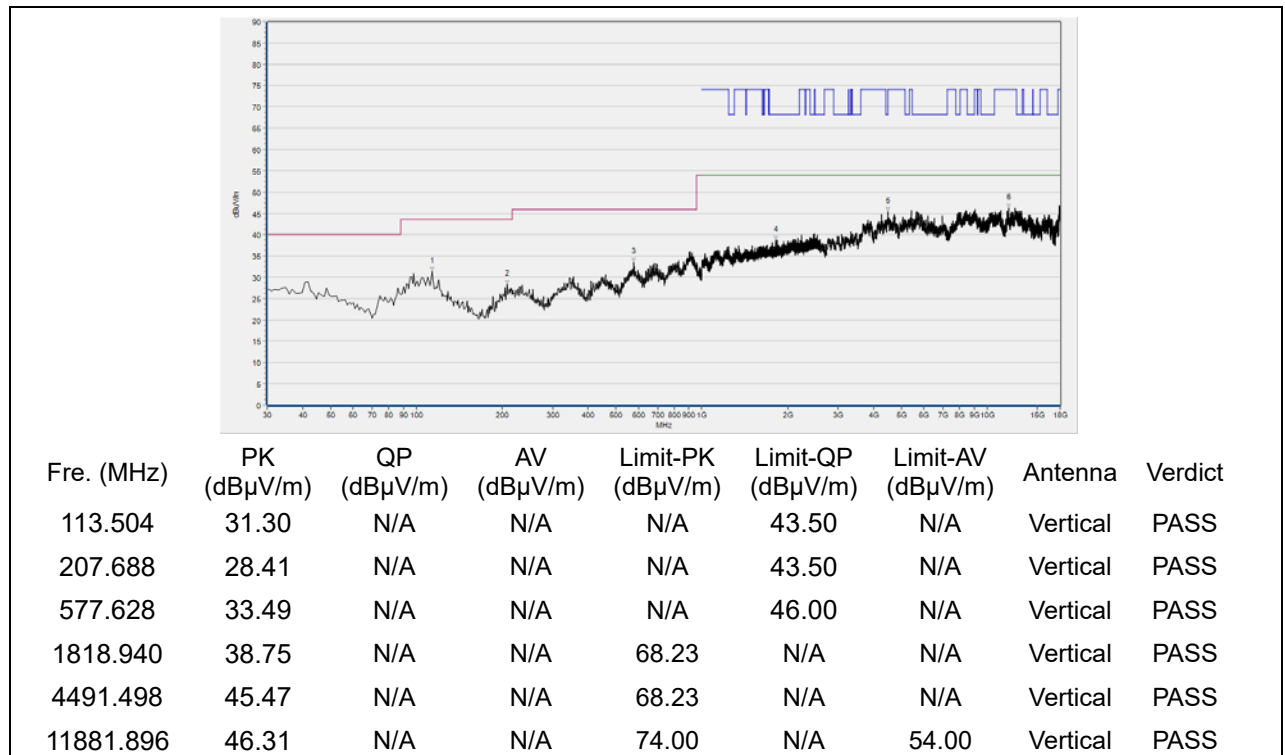
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
100.881	29.44	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
228.078	27.85	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
577.628	33.28	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1679.693	38.00	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5181.556	45.77	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12679.776	46.82	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 48

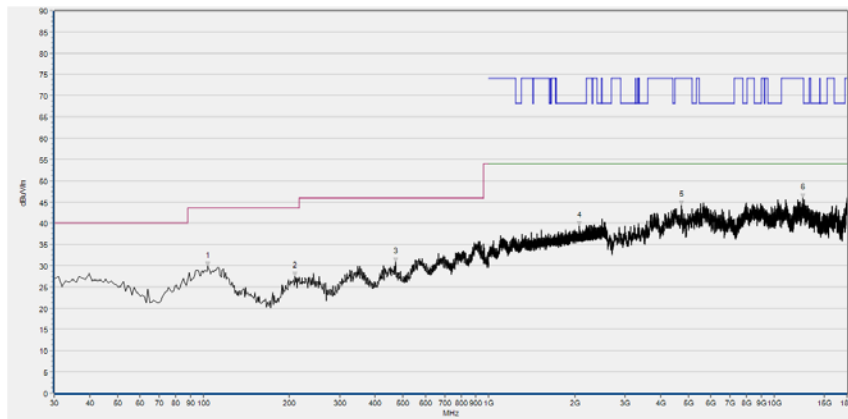


(Antenna Horizontal, 30MHz to 18GHz)



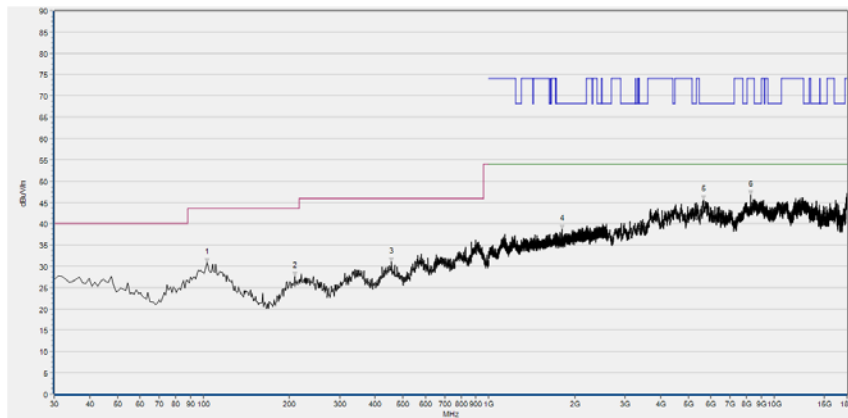
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 149



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
103.794	29.84	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
209.630	27.43	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
470.821	30.90	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2070.757	39.37	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
4719.464	44.23	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12605.841	45.87	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

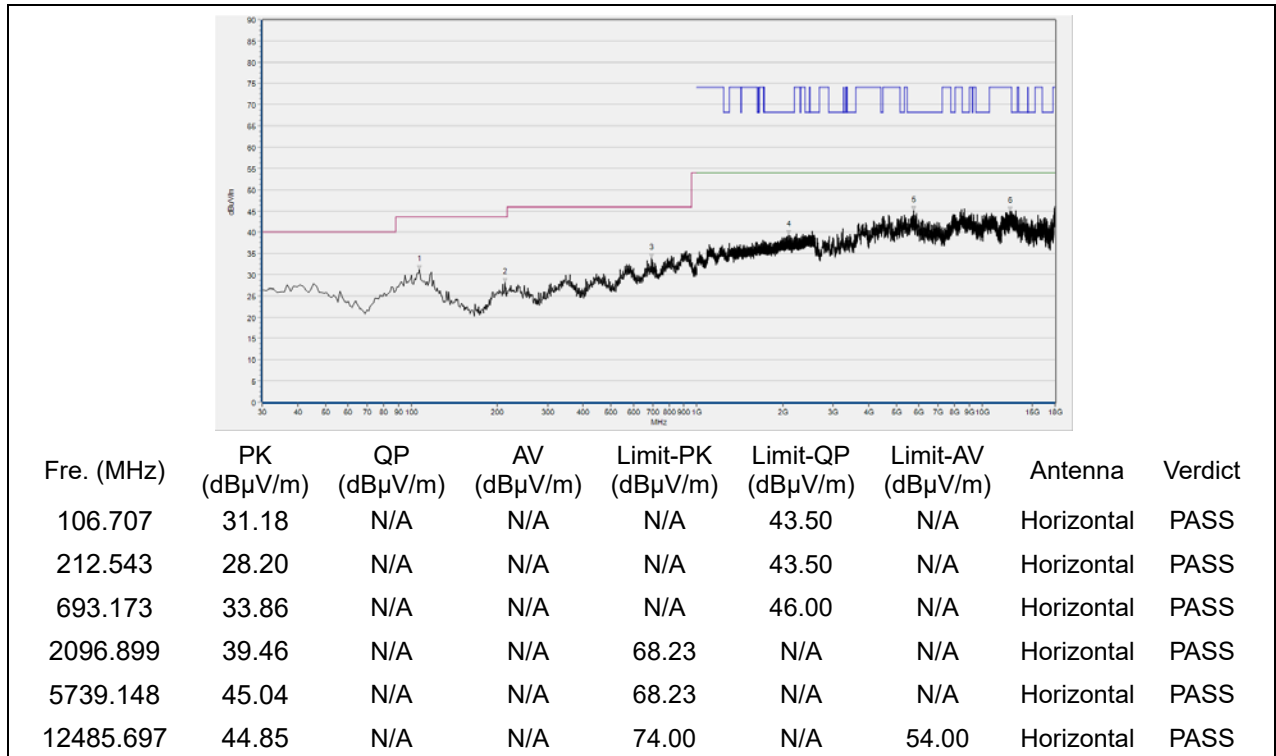
(Antenna Horizontal, 30MHz to 18GHz)



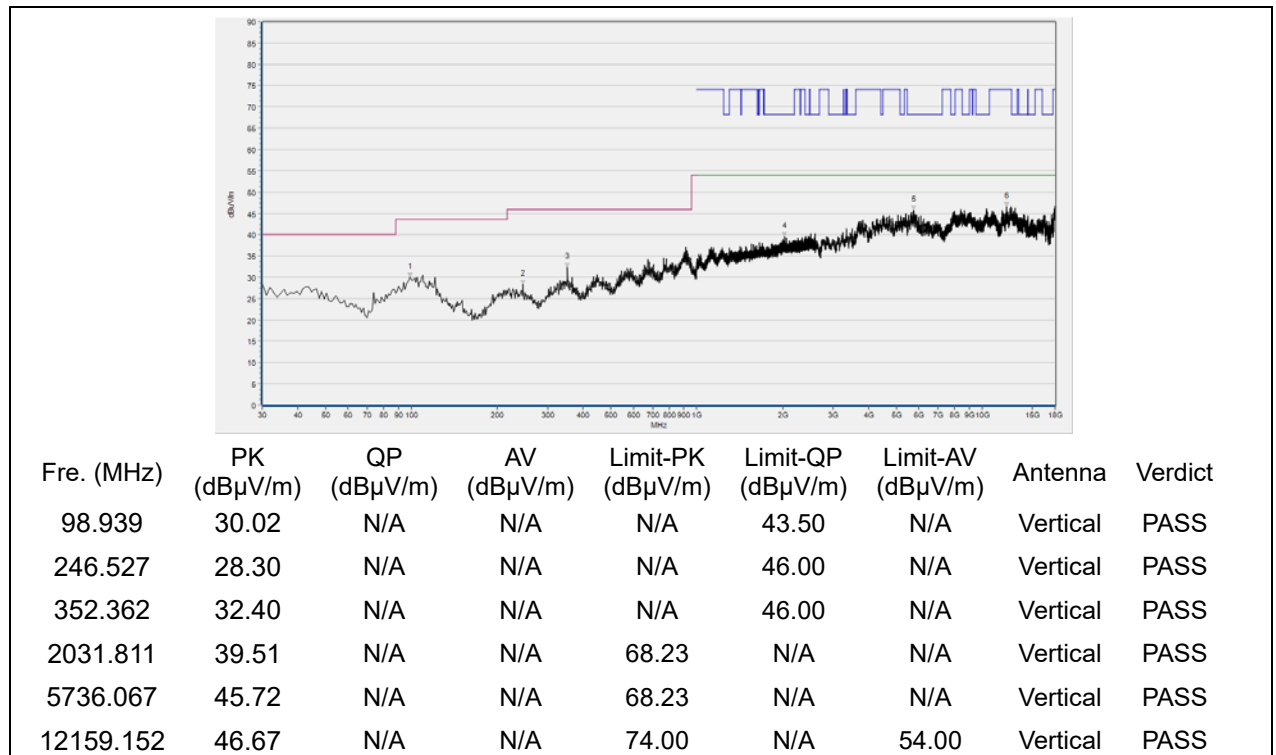
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
102.823	30.90	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
208.659	27.71	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
456.256	31.00	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1807.202	38.72	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
5637.487	45.58	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
8268.334	46.68	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 157

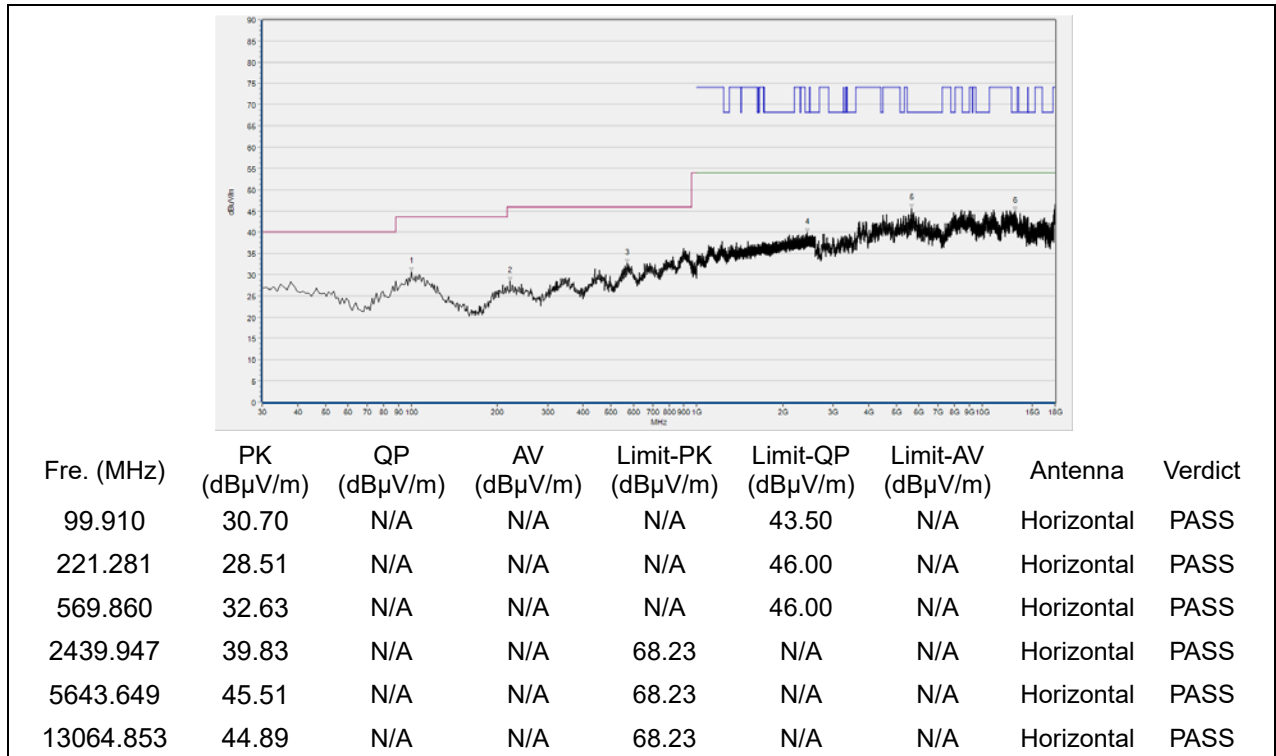


(Antenna Horizontal, 30MHz to 18GHz)

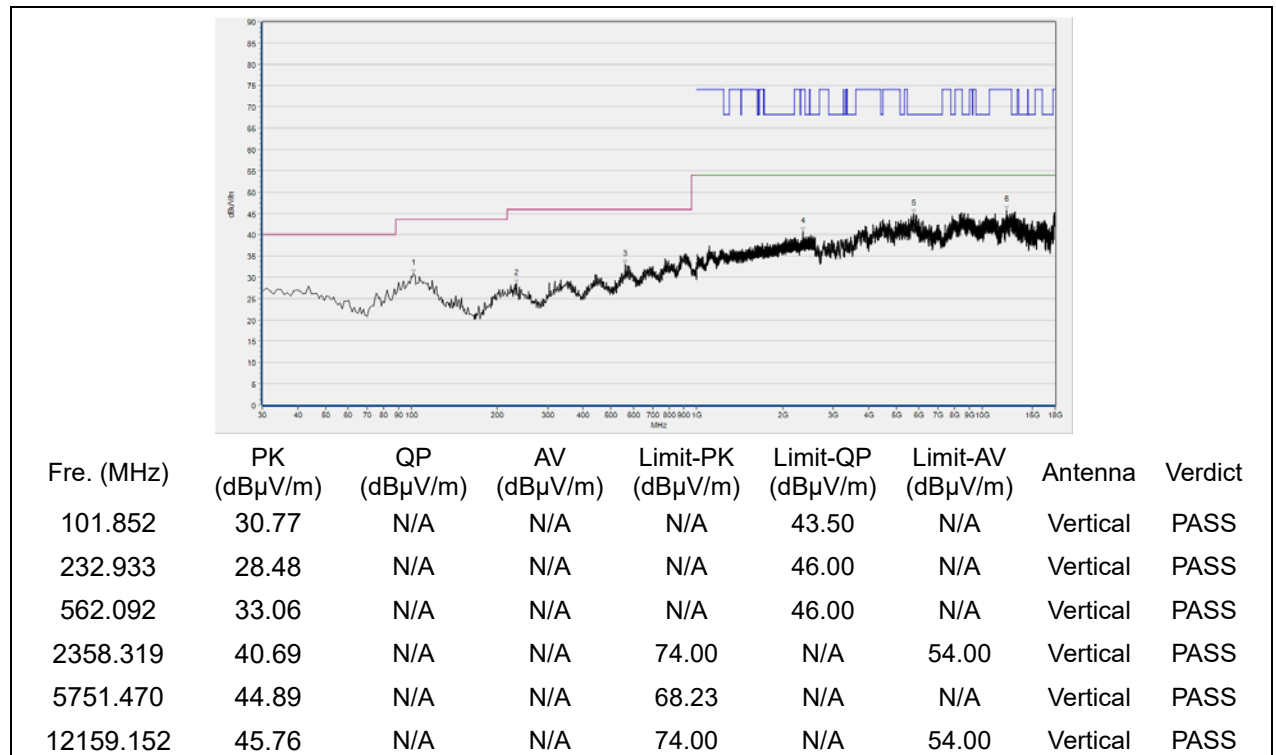


(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 165



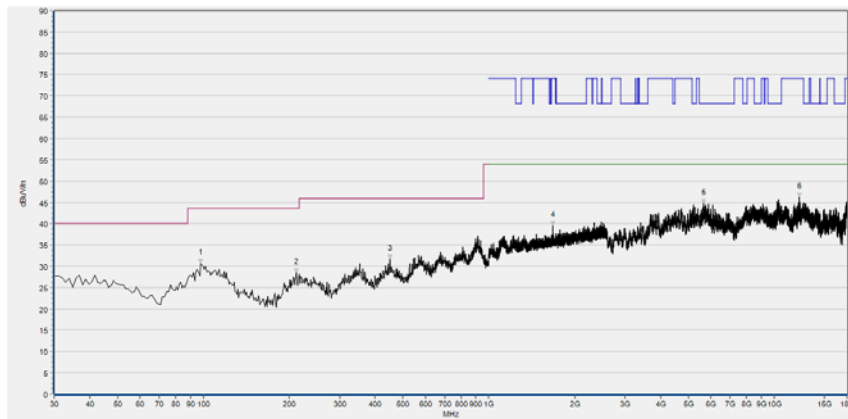
(Antenna Horizontal, 30MHz to 18GHz)



(Antenna Vertical, 30MHz to 18GHz)

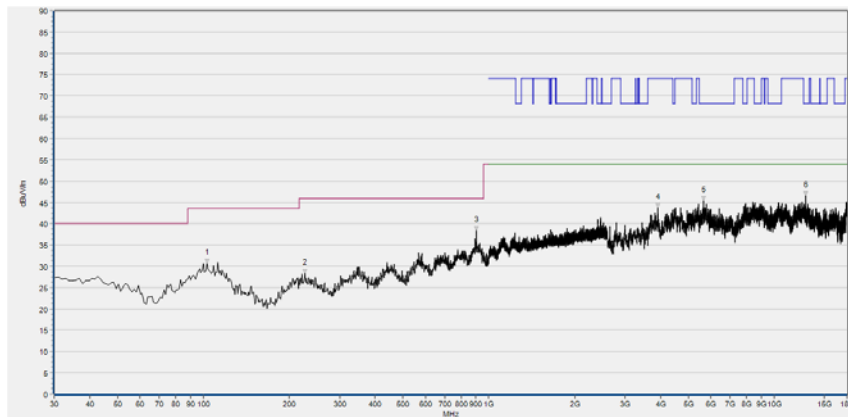
**802.11n (HT40) mode**

Plot for Channel 38



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
97.968	30.67	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
211.572	28.43	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
451.401	31.59	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1674.358	39.61	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5646.729	44.71	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12199.200	46.29	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

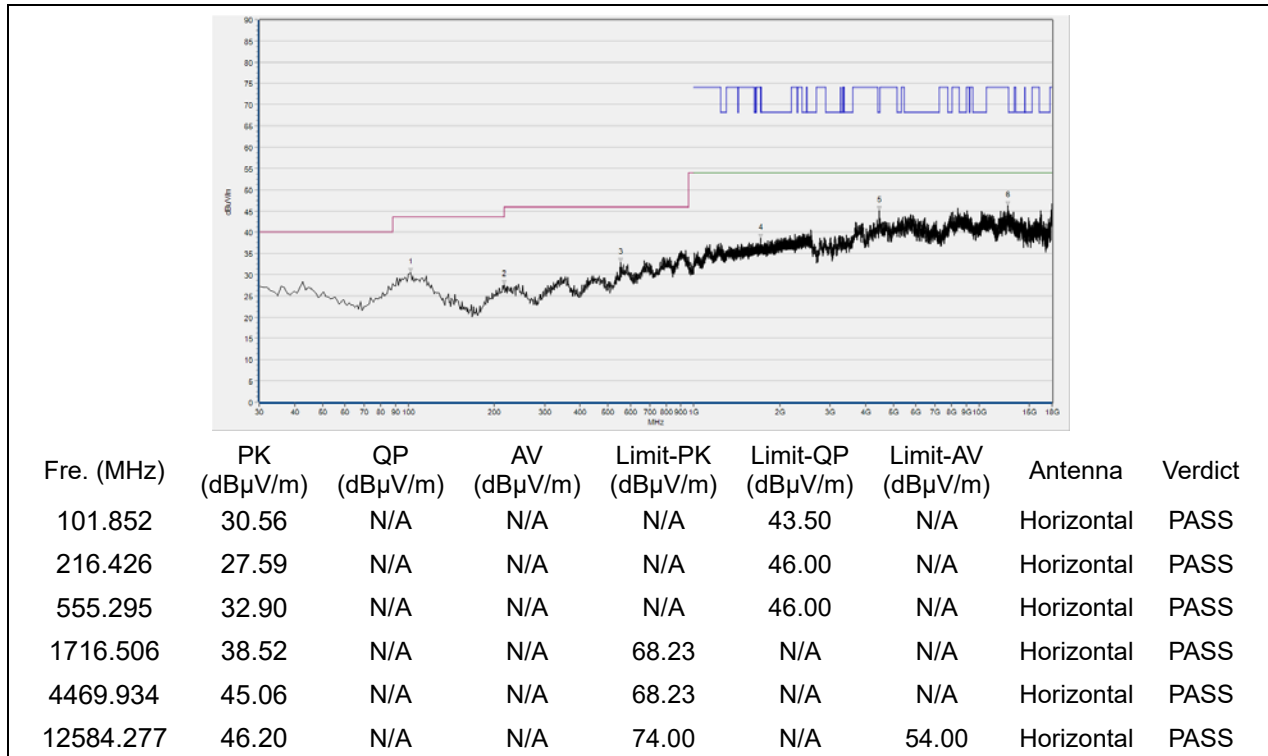
(Antenna Horizontal, 30MHz to 18GHz)



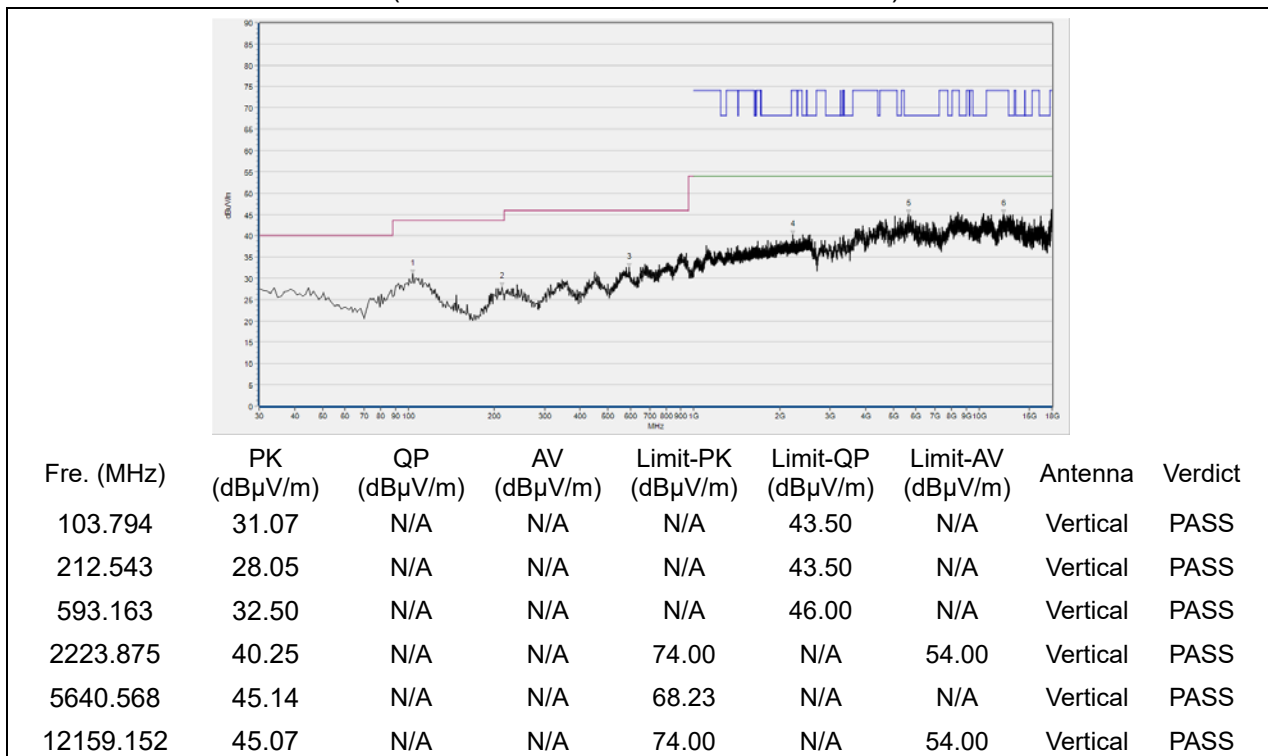
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
102.823	30.63	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
226.136	28.28	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
904.845	38.38	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
3906.181	43.69	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5640.568	45.37	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12916.983	46.54	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 46

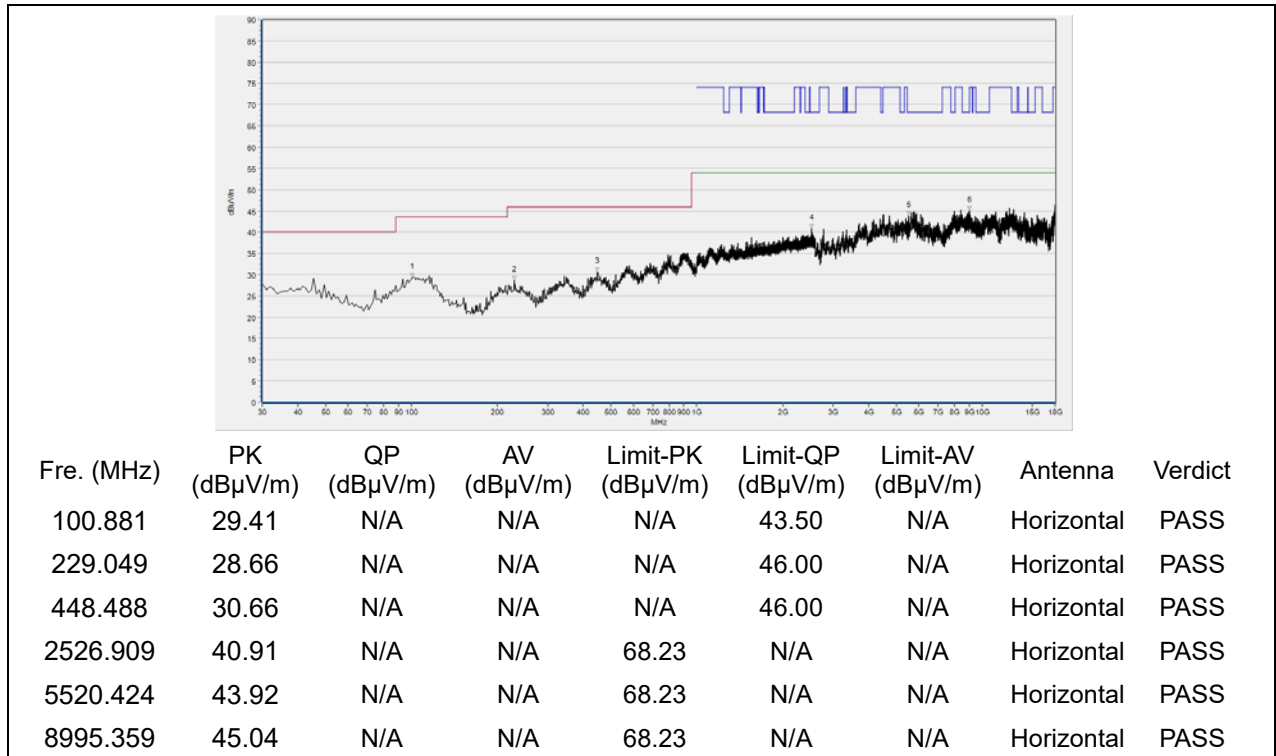


(Antenna Horizontal, 30MHz to 18GHz)

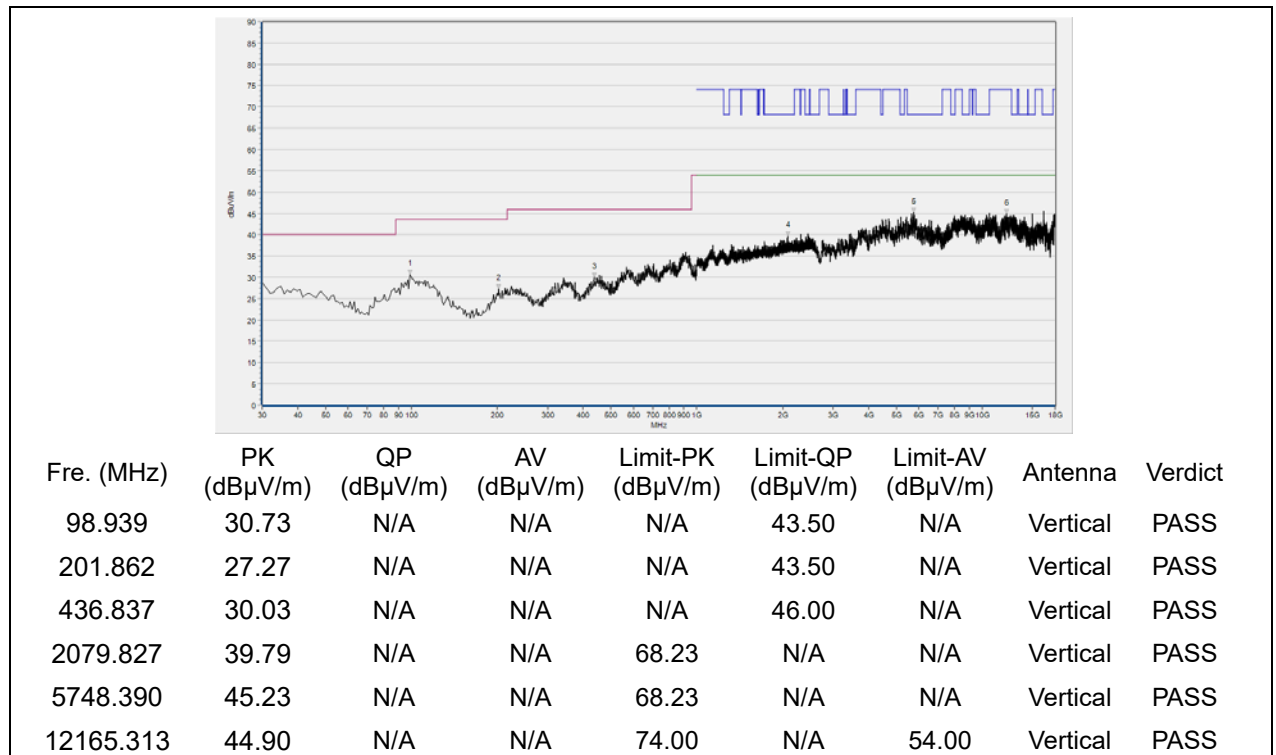


(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 151



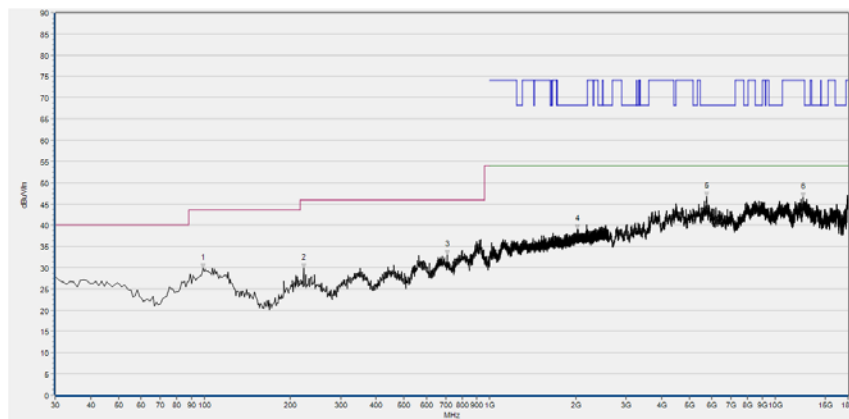
(Antenna Horizontal, 30MHz to 18GHz)



(Antenna Vertical, 30MHz to 18GHz)

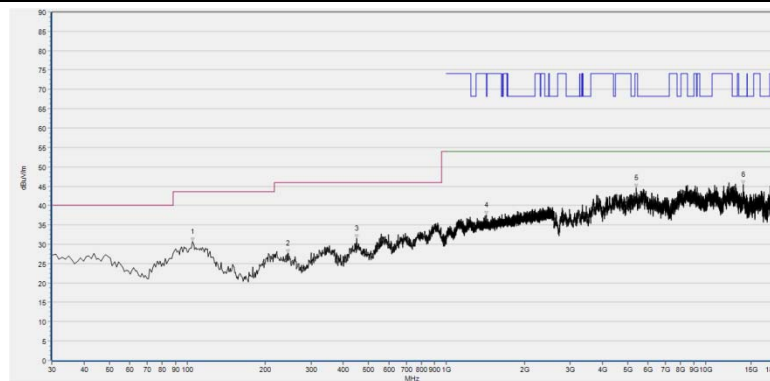


Plot for Channel 159



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
98.939	29.83	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
223.223	29.78	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
708.709	33.04	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2020.607	39.07	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
5760.712	46.79	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12498.020	46.57	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
104.765	30.61	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
244.585	27.58	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
451.401	31.56	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1427.876	37.51	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
5387.958	44.50	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13982.877	45.34	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

END OF REPORT