REPORT No. : SZ3030238W07

TEST REPORT

APPLICANT	:	Cyrus Technology GmbH
PRODUCT NAME	:	ConnectedRide Navigator
MODEL NAME	:	CRN1
BRAND NAME	:	BMW Motorrad
FCC ID	:	2AI3KCRN1
STANDARD(S)	:	47 CFR Part 15 Subpart E
RECEIPT DATE	:	2023-04-10
TEST DATE	:	2023-04-28 to 2023-07-27
ISSUE DATE	:	2023-07-27

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Change History		
Version	**Date**	**Reason for change**
1.0	2023-07-27	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	May 06, 2023	He Yuyang	PASS	No deviation
3	15.407(a)	Maximum Conducted Output Power	Jul. 27, 2023	He Yuyang	PASS	No deviation
4	15.407(a) (e)	Emission Bandwidth	May 06, 2023	He Yuyang	PASS	No deviation
5	15.407(a)	Peak Power Spectral Density	May 06, 2023	He Yuyang	PASS	No deviation
6	15.407(g)	Frequency Stability	May 06, 2023	He Yuyang	PASS	No deviation
7	15.407(h)	DFS	May 06, 2023	He Yuyang	PASS	No deviation
8	15.207	Conducted Emission	Jul. 17, 2023	Fan Zehang	PASS	No deviation
9	15.407(b)	Restricted Frequency Bands	Jul. 15, 2023	Gao Jianrou	PASS	No deviation
10	15.407(b)	Radiated Emission	Jul. 15, 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 Analzyer	MY53470836	N9010A	Agilent	2022.03.01	2023.02.28
				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
				2023.06.27	2024.06.26
RF Coaxial Cable (DC-100MHz)	BNC	MRE04	Qualwave	N/A	N/A

1.2.3 List of Software Used

Description	Manufacturer	Software Version
Test System	MaiWei	2.0.0.0
Morlab EMCR 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
				2023.06.21	2024.06.20
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	S10M100L3802	LUCIX CORP.	2022.07.08	2023.07.07
				2023.06.27	2024.06.26
Preamplifier (2GHz-18GHz)	61171/61172	S020180L3203	LUCIX CORP.	2022.07.08	2023.07.07
				2023.06.27	2024.06.26
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
				2023.06.27	2024.06.26
RF Coaxial Cable (DC-18GHz)	MRE002	CLU18	Pasternack	2022.07.08	2023.07.07
				2023.06.27	2024.06.26
RF Coaxial Cable (DC-18GHz)	MRE003	CLU18	Pasternack	2022.07.08	2023.07.07
				2023.06.27	2024.06.26
RF Coaxial Cable (DC-40GHz)	22290045	QA360-40-KK-0.5	Qualwave	2022.07.08	2023.07.07
				2023.06.27	2024.06.26
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40-KKF-2	Qualwave	2022.07.08	2023.07.07
				2023.06.27	2024.06.26
RF Coaxial Cable (DC-18GHz)	22120181	QA500-18-NN-5	Qualwave	2022.07.08	2023.07.07
				2023.06.27	2024.06.26
Notch Filter	N/A	WRCG-5150-5350	Wainwright	N/A	N/A
Notch Filter	N/A	WRCG-5470-5725	Wainwright	N/A	N/A
Notch Filter	N/A	WRCG-5725-5850	Wainwright	N/A	N/A

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	±2.22dB	Confidence levels of 95%
Power Spectral Density	±2.22dB	Confidence levels of 95%
Bandwidth	±5%	Confidence levels of 95%
Restricted Frequency Bands	±5%	Confidence levels of 95%
Radiated Emission	±2.95dB	Confidence levels of 95%
Conducted Emission	±2.44dB	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	Cyrus Technology GmbH
Applicant Address	Hergelsbendenstr. 49 D-52080 Aachen Germany
Manufacturer	Cyrus Technology GmbH
Manufacturer Address	Hergelsbendenstr. 49 D-52080 Aachen Germany

2.2. Information of EUT

Product Name:	ConnectedRide Navigator	
Sample No.:	4#	
Hardware Version:	80BMW-N1.0009	
Software Version:	BMW-CRN-20230421-V1.0.0	
Modulation Technology:	OFDM	
Modulation Mode:	802.11a, 802.11n (HT20), 802.11n (HT40) 802.11ac (VHT20), 802.11ac (VHT40)	
Operating Frequency Range:	5180MHz-5240MHz; 5260MHz-5320MHz; 5500MHz-5720MHz; 5745MHz-5825MHz	
Antenna Type:	PIFA Antenna	
Antenna Gain:	3.88dBi	
Accessory Information:	Battery	
	Brand Name:	BMW Motorrad
	Model No.:	N1
	Serial No.:	N/A
	Capacity:	3000mAh
	Rated Voltage:	3.8V
	Charge Limit:	4.35V
	Manufacturer:	Shenzhen Aerospace Electronic Co.,Ltd.

Note 1: We use the dedicated software to control the EUT continuous transmission.

Note 2: 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-2A) 5260MHz-5320MHz				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	**52**	**5260**	56	5280
	60	**5300**	**64**	**5320**
40MHz	**54**	**5270**	**62**	**5310**
(U-NII-2C) 5500MHz-5720MHz				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	**100**	**5500**	105	5520
	108	5540	112	5560
	116	5580	**120**	**5600**
	124	5620	128	5640
	132	5660	136	5680
	140	5700	**144**	**5720**
40MHz	**102**	**5510**	110	5550
	118	5590	**126**	**5630**
	134	5670	**142**	**5710**
(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**	**6**/9/12/18/24/36/48/54Mbps	N/A
			DQPSK		
			CCK		
802.11n	20/40 (HT20/40)	OFDM	**BPSK**	**MCS0**~MCS7	N/A
			QPSK		
			16QAM		
			64QAM		
802.11ac	20/40/80 (VHT20/40)	OFDM	**BPSK**	**MSC0**~MCS9	N/A
			QPSK		
			16QAM		
			64QAM		
			256QAM		

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.

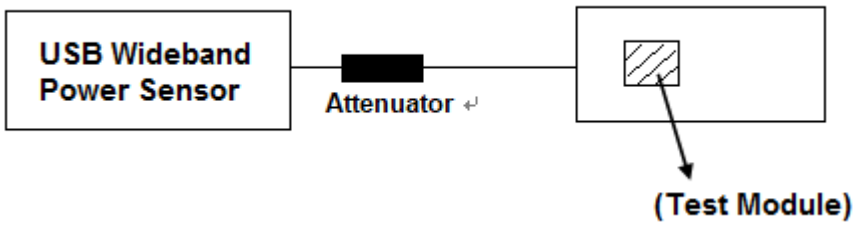
2.5. Test Conditions

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

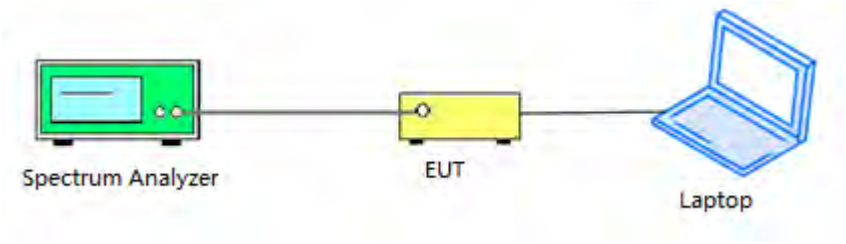
2.6. Test Setup Layout Diagram

2.6.1.Conducted Measurement

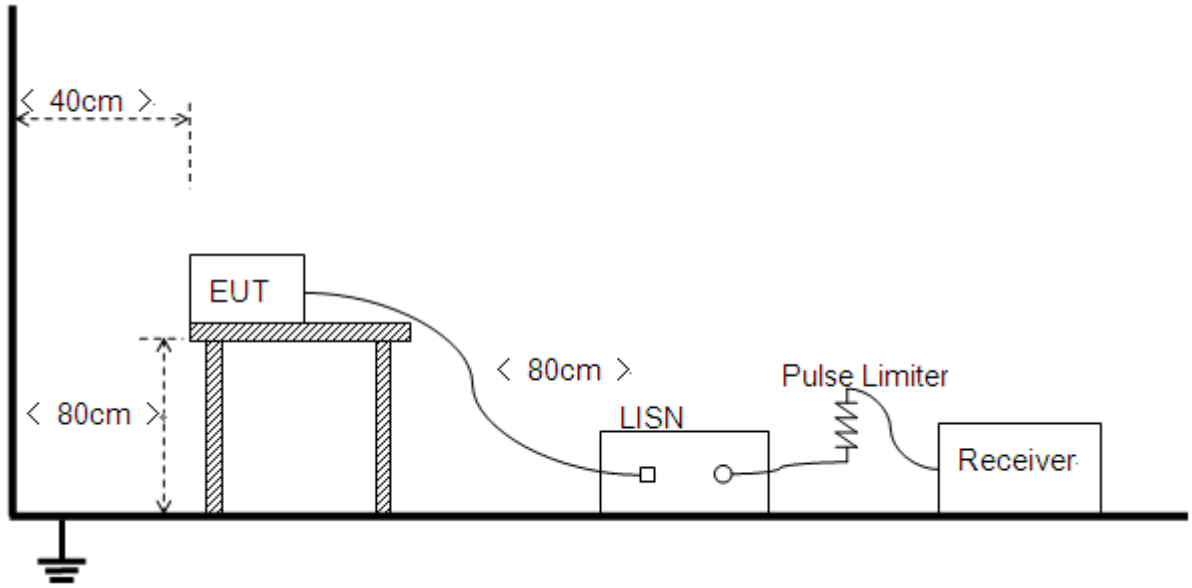
For power item that BW below 80MHz system:



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

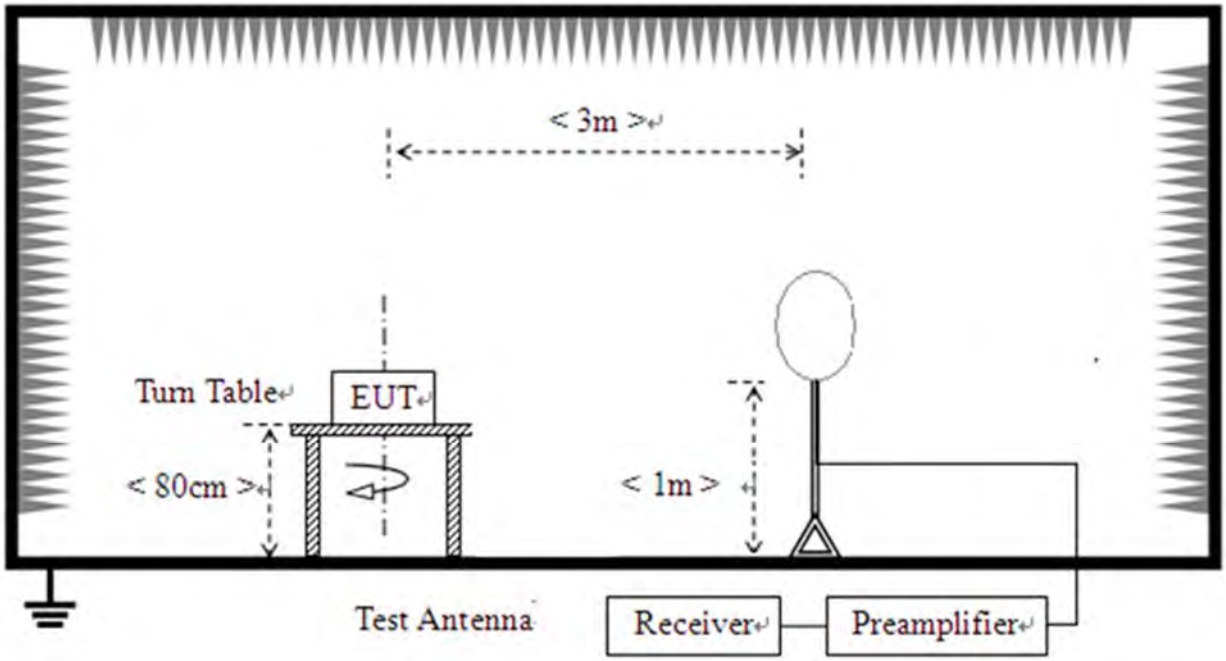


2.6.2.Conducted Emission Measurement

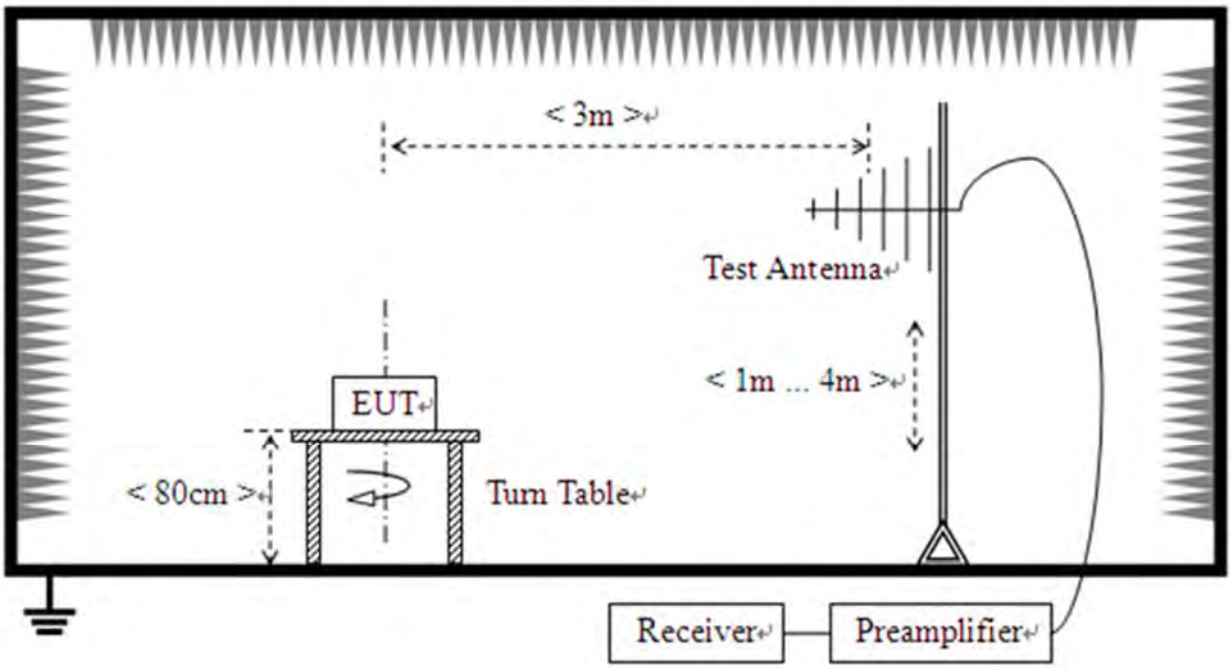


2.6.3.Radiation Measurement

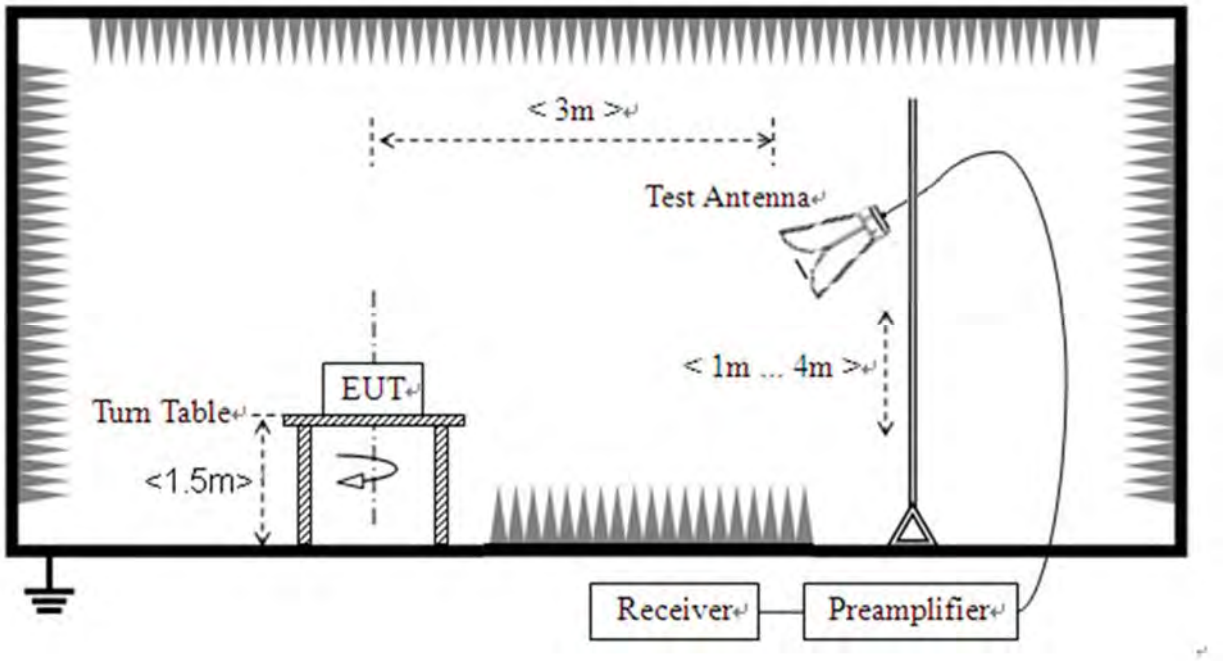
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



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

Inside of the EUT has a PIFA antenna coupled with the metal shrapnel. Please refer to the EUT 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 ±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 11dBm + 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 KDB662911D01Measure-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} +10log(N_{ANT})dBi, where G_{ANT} is the antenna gain in dBi, N_{ANT} is the number of outputs.

3.3.2.Test Procedures

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 Setup Layout

Refer to chapter 2.6.1 in this report.

3.3.4.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 theband5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 kHz.
b) Set video bandwidth (VBW) ≥ 3 × 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.

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 KDB662911D01Measure-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} +10log(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 ≥ 3MHz
3) Number of points in sweep ≥ 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°Cto 40°C. The temperature was incremented by 10º 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. Dynamic Frequency Selection

3.7.1.Requirement

According to FCC section 15.407(h), (1) Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW. (2) Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems. Operators shall only use equipment with a DFS mechanism that is turned on when operating in these bands. The device must sense for radar signals at 100 percent of its emission bandwidth. The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 mW to 1 W is −64 dBm. For devices that operate with less than 200 mW e.i.r.p. and a power spectral density of less than 10 dBm in a 1 MHz band, the minimum detection threshold is −62 dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi antenna. For the initial channel setting, the manufacturers shall be permitted to provide for either random channel selection or manual channel selection.

A U-NII network will employ a DFS function to detect signals from radar systems and to avoid co-channel operation with these systems. This applies to the 5250-5350 MHz and/or 5470-5725 MHz bands.1

Within the context of the operation of the DFS function, a U-NII device will operate in either Master Mode or Client Mode. U-NII devices operating in Client Mode can only operate in a network controlled by a U-NII device operating in Master Mode.2

Tables 1 and 2 shown below summarize the information contained in sections 5.1.1 and 5.1.2.

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master	Client Without Radar Detection

DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	**Master Device or Client with Radar Detection**	**Client Without Radar Detection**
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

The operational behavior and individual DFS requirements that are associated with these modes are as follows:

Master Devices

a) The Master Device will use DFS in order to detect Radar Waveforms with received signal strength above the DFS Detection Threshold in the 5250 − 5350 MHz and 5470 − 5725 MHz bands. DFS is not required in the 5150 − 5250 MHz or 5725 − 5825 MHz bands.

b) Before initiating a network on a Channel, the Master Device will perform a Channel Availability Check for specified time duration (Channel Availability Check Time) to ensure that there is no radar system operating on the Channel, using DFS described under subsection a) above.

c) The Master Device initiates a U-NII network by transmitting control signals that will enable other U-NII devices to Associate with the Master Device.

d) During normal operation, the Master Device will monitor the Channel (In-Service Monitoring) to ensure that there is no radar system operating on the Channel, using DFS described under a).

e) If the Master Device has detected a Radar Waveform during In-Service Monitoring as described under d), the Operating Channel of the U-NII network is no longer an Available Channel. The Master Device will instruct all associated Client Device(s) to stop transmitting on this Channel within the Channel Move Time. The transmissions during the Channel Move Time will be limited to the Channel Closing Transmission Time.

f) Once the Master Device has detected a Radar Waveform it will not utilize the Channel for the duration of the Non-Occupancy Period. 3.

g) If the Master Device delegates the In-Service Monitoring to a Client Device, then the

combination will be tested to the requirements described under d) through f) above.

Client Devices

a) A Client Device will not transmit before having received appropriate control signals from a Master Device.

b) A Client Device will stop all its transmissions whenever instructed by a Master Device to which it is associated and will meet the Channel Move Time and Channel Closing Transmission Time requirements. The Client Device will not resume any transmissions until it has again received control signals from a Master Device.

c) If a Client Device is performing In-Service Monitoring and detects a Radar Waveform above the DFS Detection Threshold, it will inform the Master Device. This is equivalent to the Master Device detecting the Radar Waveform and d) through f) of section 5.1.1 apply.

d) Irrespective of Client Device or Master Device detection the Channel Move Time and Channel Closing Transmission Time requirements remain the same.

e) The client test frequency must be monitored to ensure no transmission of any type has occurred for 30 minutes. Note: If the client moves with the master, the device is considered compliant if nothing appears in the client non-occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear.

DFS Detection Thresholds

Table 3 below provides the DFS Detection Thresholds for Master Devices as well as Client Devices incorporating In-Service Monitoring.

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 mill watt	-64 dBm
EIRP < 200 mill watt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 mill watt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

Response Requirements

Table 4 provides the response requirements for Master and Client Devices incorporating DFS.

Table 4: DFS Response Requirement Values

Parameter	Value

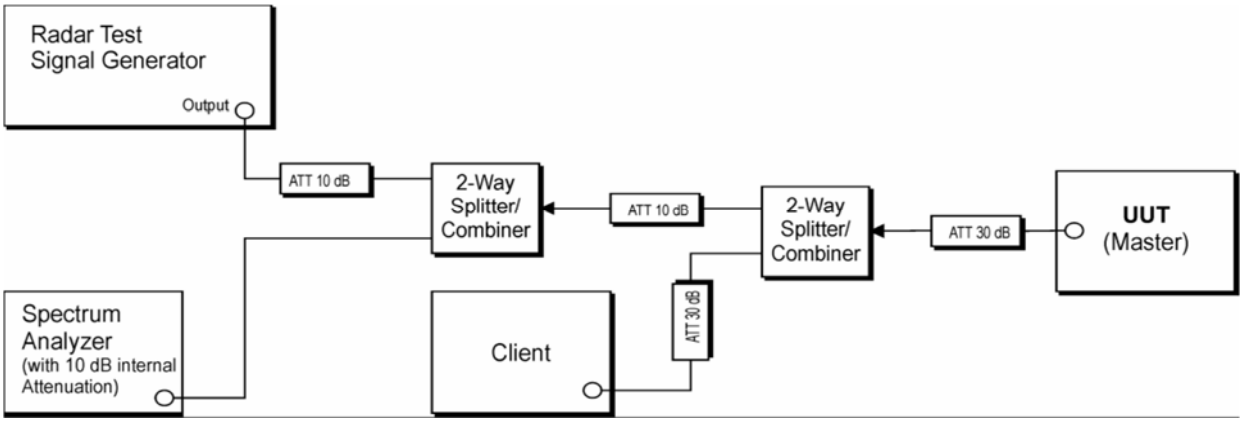
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.
Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.
Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

3.7.2.Test Description

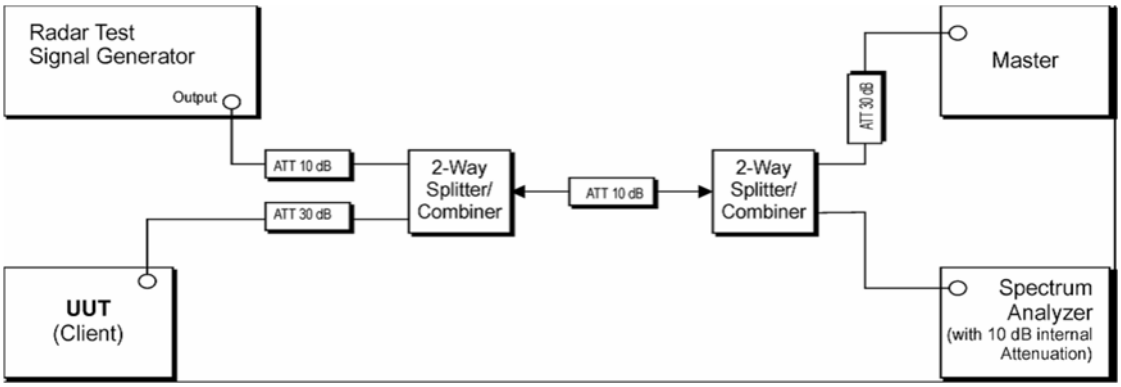
According to Section 7.2 of KDB 905462 D02 V01R01

1. Setup for Master with injection at the Master



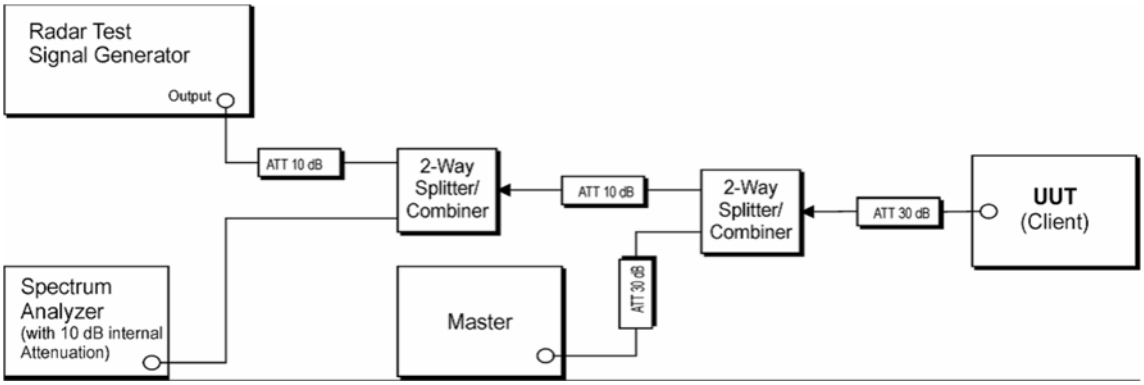
(Example Conducted Setup where UUT is a Master and Radar Test Waveforms are injected into the Master)

2. Setup for Client with injection at the Master



(Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Master)

3. Setup for Client with injection at the Client



(Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Client)

3.7.3.Information of Companion Device

Product Name:	Router
Manufacturer:	ASUS
FCC ID:	MSQ-RTAXJF00
Device Type:	Master Device
Operating Mode:	Master Mode
Serial No:	M3IAJF201046
Antenna Gain:	2.0dBi

3.7.4.Test Result

Refer to Annex A.6 in this report.

3.8. Conducted Emission

3.8.1.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 50μH/50Ω line impedance stabilization network (LISN).

Frequency Range (MHz)	Conducted Limit (dBμV)	
	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.

3.8.2.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.

3.8.3.Test Setup Layout

Refer to chapter 2.6.2 in this report.

3.8.4.Test Result

Refer to Annex A.7 in this report.

3.9. Restricted Frequency Bands

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:
(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);

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

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 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.

3.9.3.Test Setup Layout

Refer to chapter 2.6.3 in this report.

3.9.4.Test Result

Refer to Annex A.8 in this report.

3.10. Radiated Emission

3.10.1.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);

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

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).

3.10.2.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.

3.10.3.Test Setup Layout

Refer to chapter 2.6.3 in this report.

3.10.4.Test Result

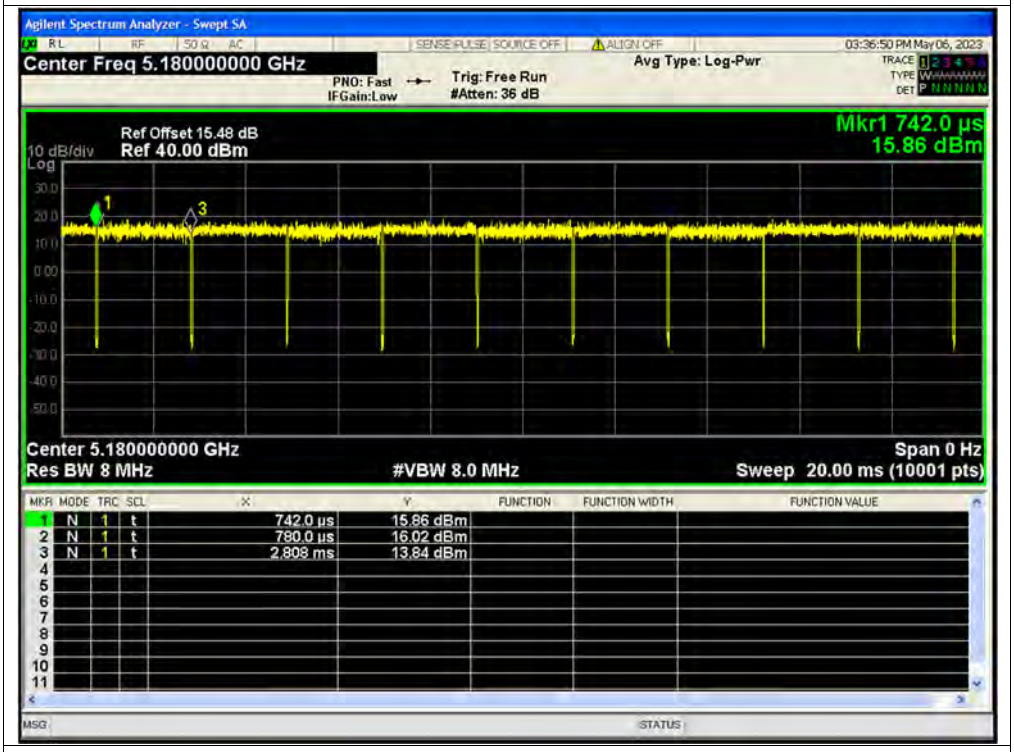
Refer to Annex A.9 in this report.

Annex A Test Data and Result

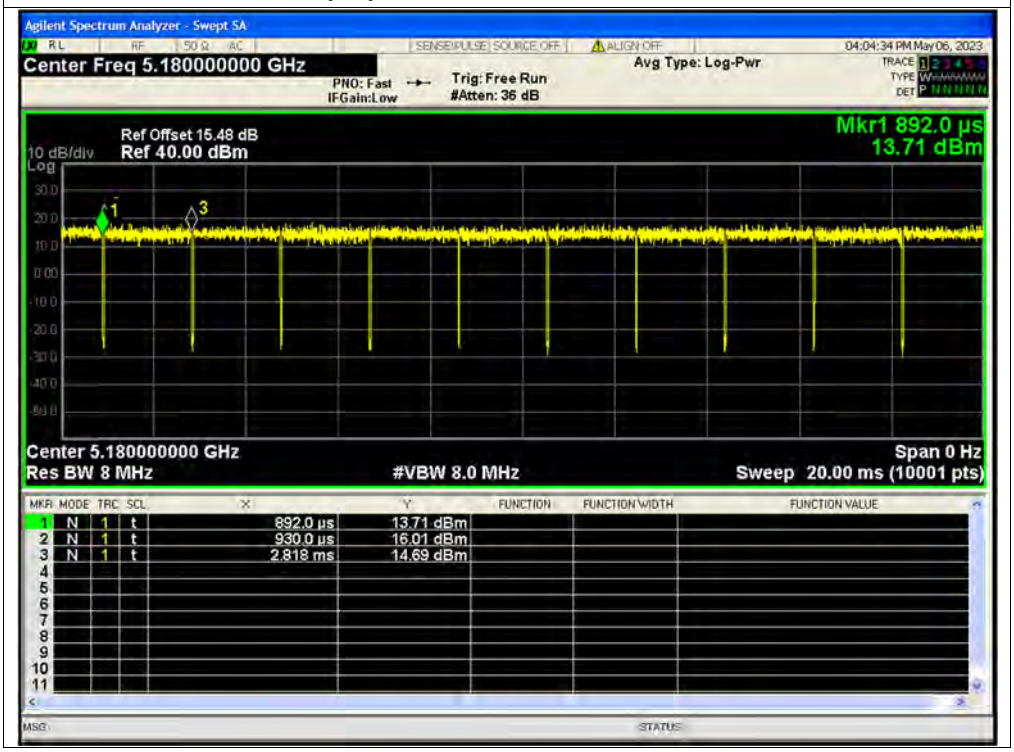
A.1. Duty Cycle of Test Signal

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	Ant1	98.16	0.08	0.49
NVNT	n20	5180	Ant1	98.03	0.09	0.53
NVNT	n40	5190	Ant1	96.27	0.17	1.08
NVNT	ac20	5180	Ant1	98.14	0.08	0.53
NVNT	ac40	5190	Ant1	96.3	0.16	1.07

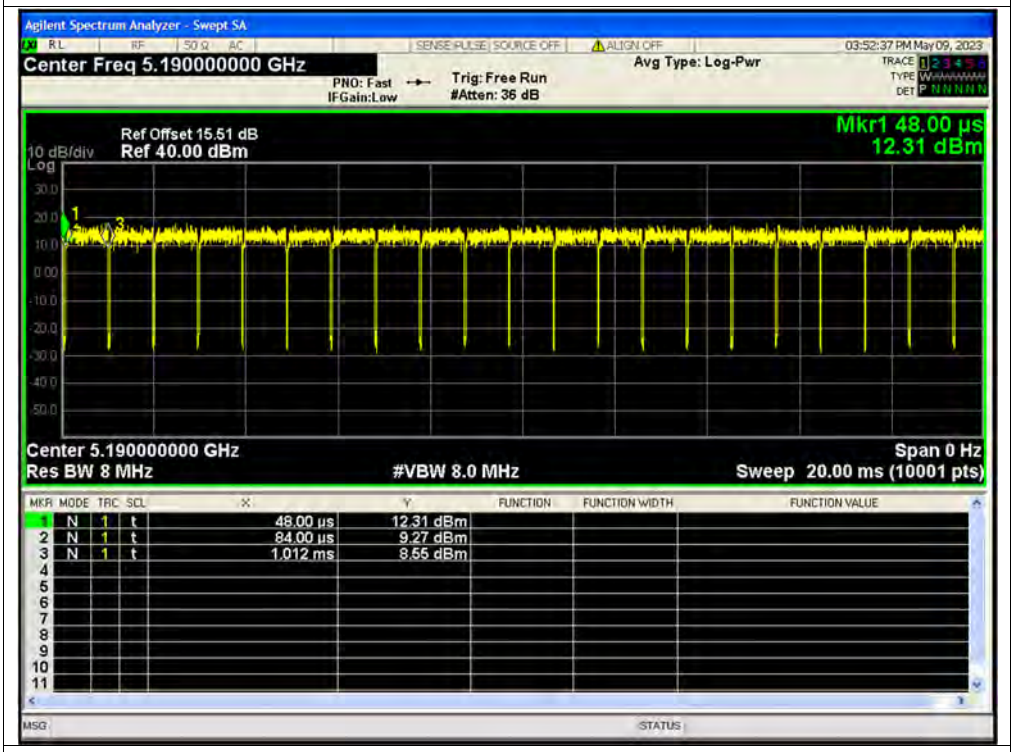
Test Graphs
Duty Cycle NVNT a 5180MHz Ant1



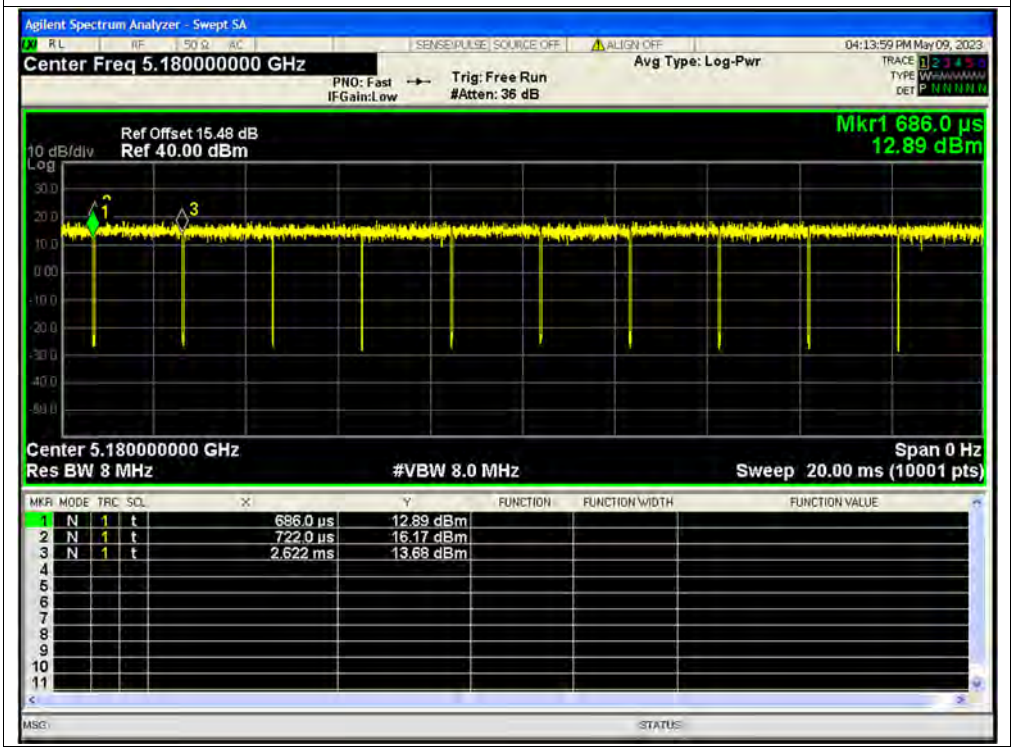
Duty Cycle NVNT n20 5180MHz Ant1



Duty Cycle NVNT n40 5190MHz Ant1



Duty Cycle NVNT ac20 5180MHz Ant1



A.2. Maximum Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Total Conducted Power (dBm)	Total Conducted Power (mW)	Limit (dBm)	Verdict
NVNT	a	5180	Ant1	15.04	31.92	24	Pass
NVNT	a	5220	Ant1	14.91	30.97	24	Pass
NVNT	a	5240	Ant1	14.56	28.58	24	Pass
NVNT	a	5260	Ant1	15	31.62	24	Pass
NVNT	a	5300	Ant1	14.58	28.71	24	Pass
NVNT	a	5320	Ant1	14.18	26.18	24	Pass
NVNT	a	5500	Ant1	15.28	33.73	24	Pass
NVNT	a	5580	Ant1	15.78	37.84	24	Pass
NVNT	a	5600	Ant1	16.04	40.18	24	Pass
NVNT	a	5700	Ant1	15.8	38.02	24	Pass
NVNT	a	5720	Ant1	15.63	36.56	24	Pass
NVNT	a	5745	Ant1	15.28	33.73	30	Pass
NVNT	a	5785	Ant1	14.88	30.76	30	Pass
NVNT	a	5825	Ant1	14.18	26.18	30	Pass
NVNT	n20	5180	Ant1	14.31	26.98	24	Pass
NVNT	n20	5220	Ant1	14.21	26.36	24	Pass
NVNT	n20	5240	Ant1	13.8	23.99	24	Pass
NVNT	n20	5260	Ant1	14.4	27.54	24	Pass
NVNT	n20	5300	Ant1	13.99	25.06	24	Pass
NVNT	n20	5320	Ant1	13.52	22.49	24	Pass
NVNT	n20	5500	Ant1	14.19	26.24	24	Pass
NVNT	n20	5580	Ant1	14.86	30.62	24	Pass
NVNT	n20	5600	Ant1	15.15	32.73	24	Pass
NVNT	n20	5720	Ant1	14.85	30.55	24	Pass
NVNT	n20	5745	Ant1	14.58	28.71	30	Pass
NVNT	n20	5785	Ant1	13.97	24.95	30	Pass
NVNT	n20	5825	Ant1	13.22	20.99	30	Pass
NVNT	n40	5190	Ant1	12.01	15.89	24	Pass
NVNT	n40	5230	Ant1	14.11	25.76	24	Pass
NVNT	n40	5270	Ant1	13.56	22.7	24	Pass
NVNT	n40	5310	Ant1	11.06	12.76	24	Pass
NVNT	n40	5510	Ant1	13.36	21.68	24	Pass
NVNT	n40	5550	Ant1	14.28	26.79	24	Pass
NVNT	n40	5630	Ant1	14.78	30.06	24	Pass

NVNT	n40	5710	Ant1	14.43	27.73	24	Pass
NVNT	n40	5755	Ant1	14.19	26.24	30	Pass
NVNT	n40	5795	Ant1	13.18	20.8	30	Pass
NVNT	ac20	5180	Ant1	14.16	26.06	24	Pass
NVNT	ac20	5220	Ant1	14.11	25.76	24	Pass
NVNT	ac20	5240	Ant1	13.64	23.12	24	Pass
NVNT	ac20	5260	Ant1	14.23	26.49	24	Pass
NVNT	ac20	5300	Ant1	13.78	23.88	24	Pass
NVNT	ac20	5320	Ant1	13.28	21.28	24	Pass
NVNT	ac20	5500	Ant1	14.31	26.98	24	Pass
NVNT	ac20	5580	Ant1	14.89	30.83	24	Pass
NVNT	ac20	5600	Ant1	15.17	32.89	24	Pass
NVNT	ac20	5720	Ant1	14.87	30.69	24	Pass
NVNT	ac20	5745	Ant1	14.54	28.44	30	Pass
NVNT	ac20	5785	Ant1	13.99	25.06	30	Pass
NVNT	ac20	5825	Ant1	13.18	20.8	30	Pass
NVNT	ac40	5190	Ant1	12.01	15.89	24	Pass
NVNT	ac40	5230	Ant1	14.15	26	24	Pass
NVNT	ac40	5270	Ant1	14.15	26	24	Pass
NVNT	ac40	5310	Ant1	11.85	15.31	24	Pass
NVNT	ac40	5510	Ant1	13.49	22.34	24	Pass
NVNT	ac40	5550	Ant1	13.86	24.32	24	Pass
NVNT	ac40	5630	Ant1	14.37	27.35	24	Pass
NVNT	ac40	5710	Ant1	13.98	25	24	Pass
NVNT	ac40	5755	Ant1	14.21	26.36	30	Pass
NVNT	ac40	5795	Ant1	13.2	20.89	30	Pass

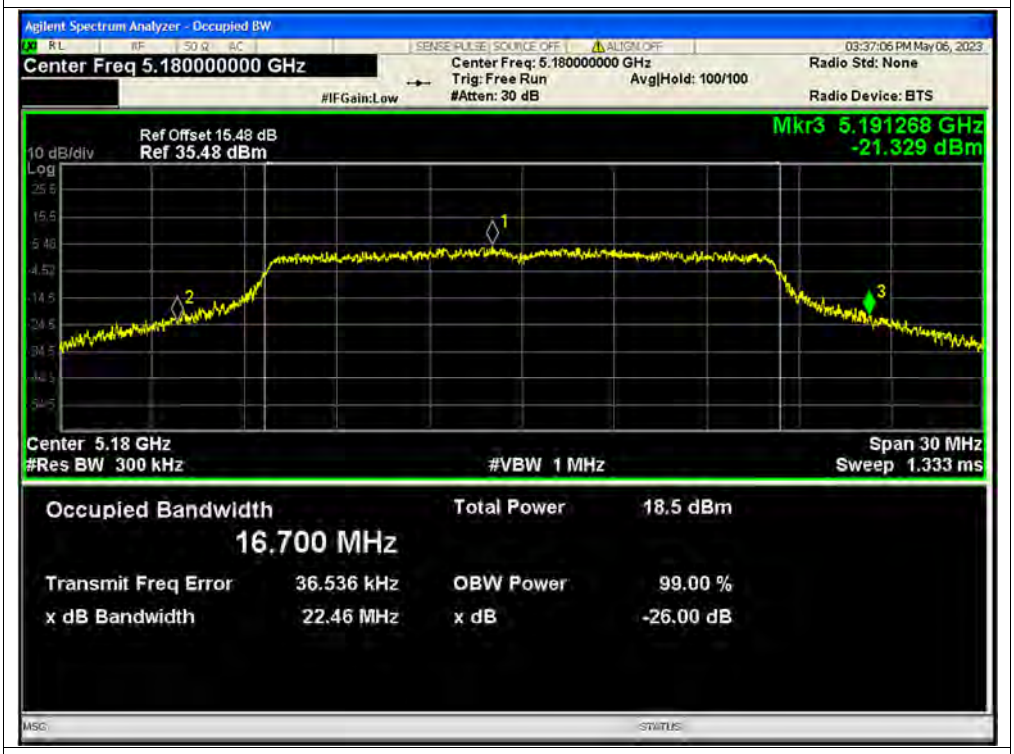
A.3. Emission Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-26 dB Bandwidth (MHz)	Verdict
NVNT	a	5180	Ant1	22.463	0.5
NVNT	a	5220	Ant1	23.45	0.5
NVNT	a	5240	Ant1	22.851	0.5
NVNT	a	5260	Ant1	23.294	0.5
NVNT	a	5300	Ant1	23.099	0.5
NVNT	a	5320	Ant1	22.861	0.5
NVNT	a	5500	Ant1	23.188	0.5
NVNT	a	5580	Ant1	23.034	0.5
NVNT	a	5600	Ant1	22.149	0.5
NVNT	a	5700	Ant1	23.198	0.5
NVNT	a	5720	Ant1	22.484	0.5
NVNT	n20	5180	Ant1	23.623	0.5
NVNT	n20	5220	Ant1	23.498	0.5
NVNT	n20	5240	Ant1	23.693	0.5
NVNT	n20	5260	Ant1	24.332	0.5
NVNT	n20	5300	Ant1	24.87	0.5
NVNT	n20	5320	Ant1	23.655	0.5
NVNT	n20	5500	Ant1	24.461	0.5
NVNT	n20	5580	Ant1	23.129	0.5
NVNT	n20	5600	Ant1	24.289	0.5
NVNT	n20	5720	Ant1	23.591	0.5
NVNT	n40	5190	Ant1	40.639	0.5
NVNT	n40	5230	Ant1	40.876	0.5
NVNT	n40	5270	Ant1	40.751	0.5
NVNT	n40	5310	Ant1	40.818	0.5
NVNT	n40	5510	Ant1	41.492	0.5
NVNT	n40	5550	Ant1	40.971	0.5
NVNT	n40	5630	Ant1	40.892	0.5
NVNT	n40	5710	Ant1	40.579	0.5
NVNT	ac20	5180	Ant1	24.24	0.5
NVNT	ac20	5220	Ant1	24.72	0.5
NVNT	ac20	5240	Ant1	24.495	0.5
NVNT	ac20	5260	Ant1	24.177	0.5
NVNT	ac20	5300	Ant1	24.689	0.5
NVNT	ac20	5320	Ant1	23.693	0.5

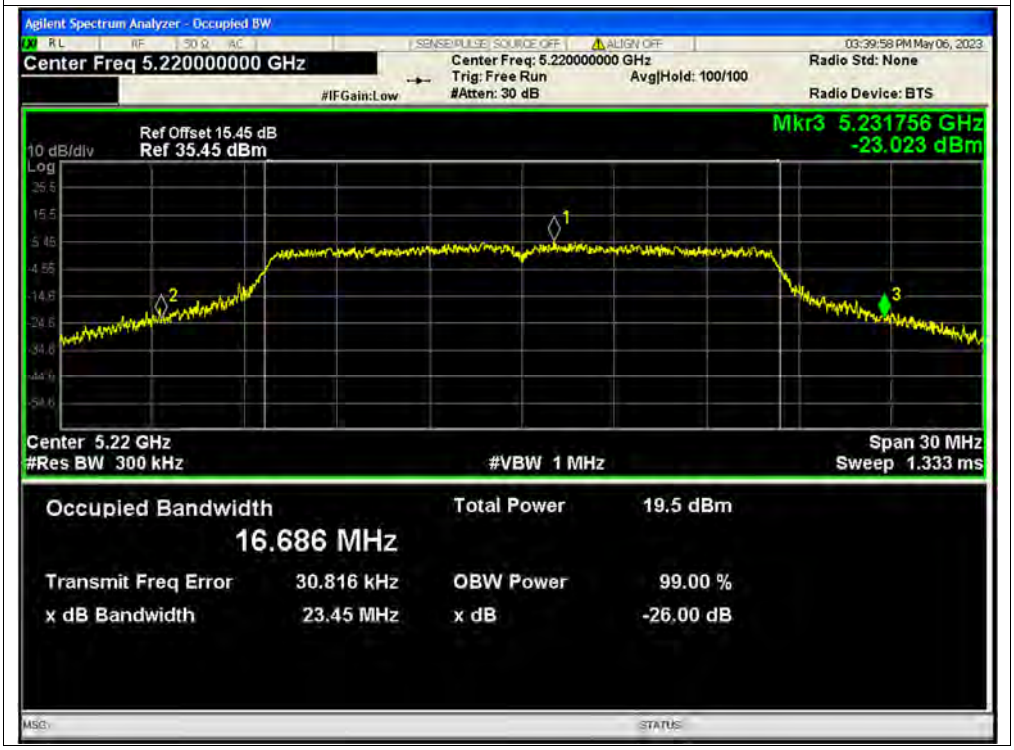
NVNT	ac20	5500	Ant1	25.114	0.5
NVNT	ac20	5580	Ant1	24.486	0.5
NVNT	ac20	5600	Ant1	23.679	0.5
NVNT	ac20	5720	Ant1	23.736	0.5
NVNT	ac40	5190	Ant1	40.769	0.5
NVNT	ac40	5230	Ant1	40.708	0.5
NVNT	ac40	5270	Ant1	40.535	0.5
NVNT	ac40	5310	Ant1	40.668	0.5
NVNT	ac40	5510	Ant1	41.007	0.5
NVNT	ac40	5550	Ant1	40.813	0.5
NVNT	ac40	5630	Ant1	40.685	0.5
NVNT	ac40	5710	Ant1	41.144	0.5

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	a	5745	Ant1	16.269	0.5	Pass
NVNT	a	5785	Ant1	16.302	0.5	Pass
NVNT	a	5825	Ant1	16.03	0.5	Pass
NVNT	n20	5745	Ant1	16.916	0.5	Pass
NVNT	n20	5785	Ant1	16.042	0.5	Pass
NVNT	n20	5825	Ant1	15.323	0.5	Pass
NVNT	n40	5755	Ant1	36.245	0.5	Pass
NVNT	n40	5795	Ant1	35.659	0.5	Pass
NVNT	ac20	5745	Ant1	17.314	0.5	Pass
NVNT	ac20	5785	Ant1	16.679	0.5	Pass
NVNT	ac20	5825	Ant1	16.759	0.5	Pass
NVNT	ac40	5755	Ant1	36.287	0.5	Pass
NVNT	ac40	5795	Ant1	35.679	0.5	Pass

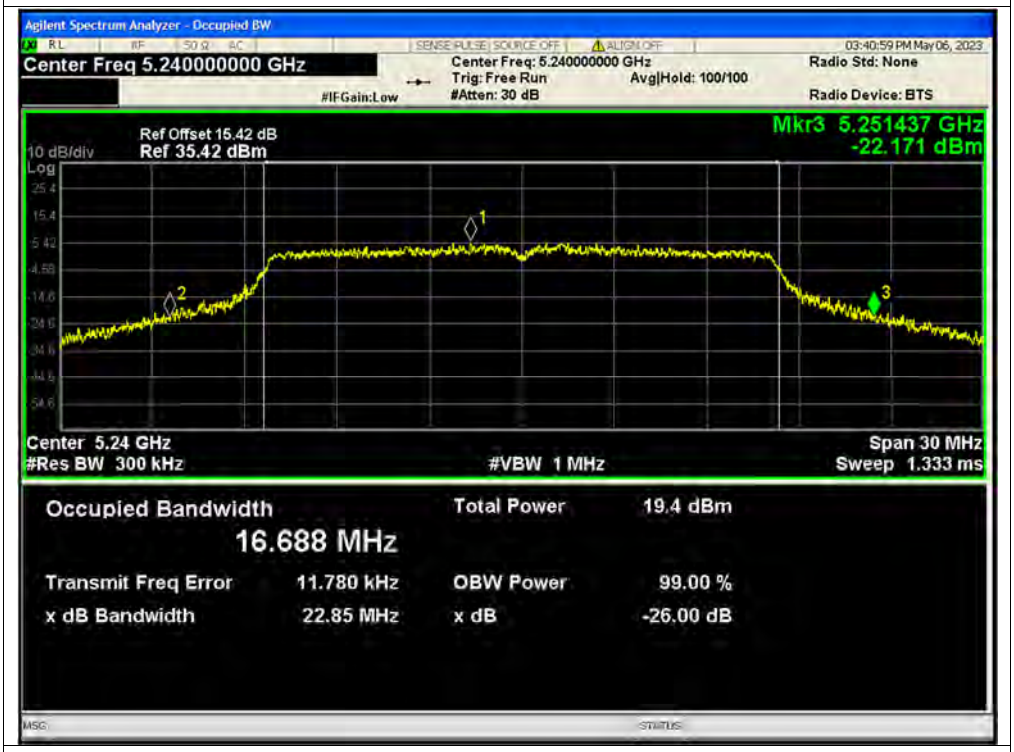
Test Graphs
-26dB Bandwidth NVNT a 5180MHz Ant1



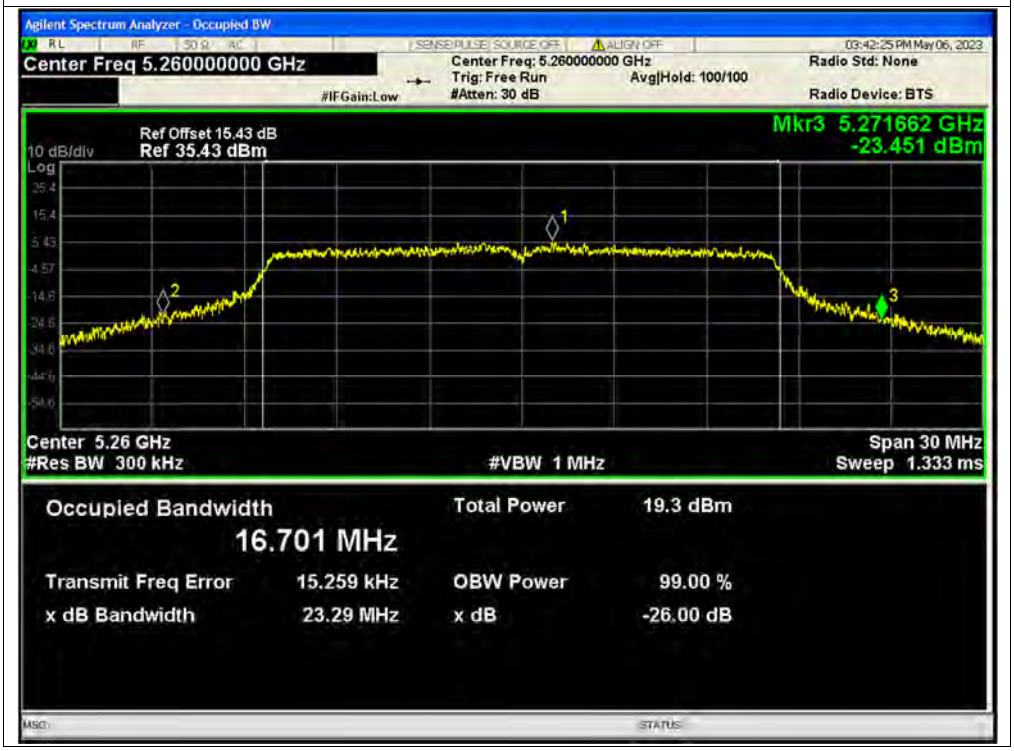
-26dB Bandwidth NVNT a 5220MHz Ant1



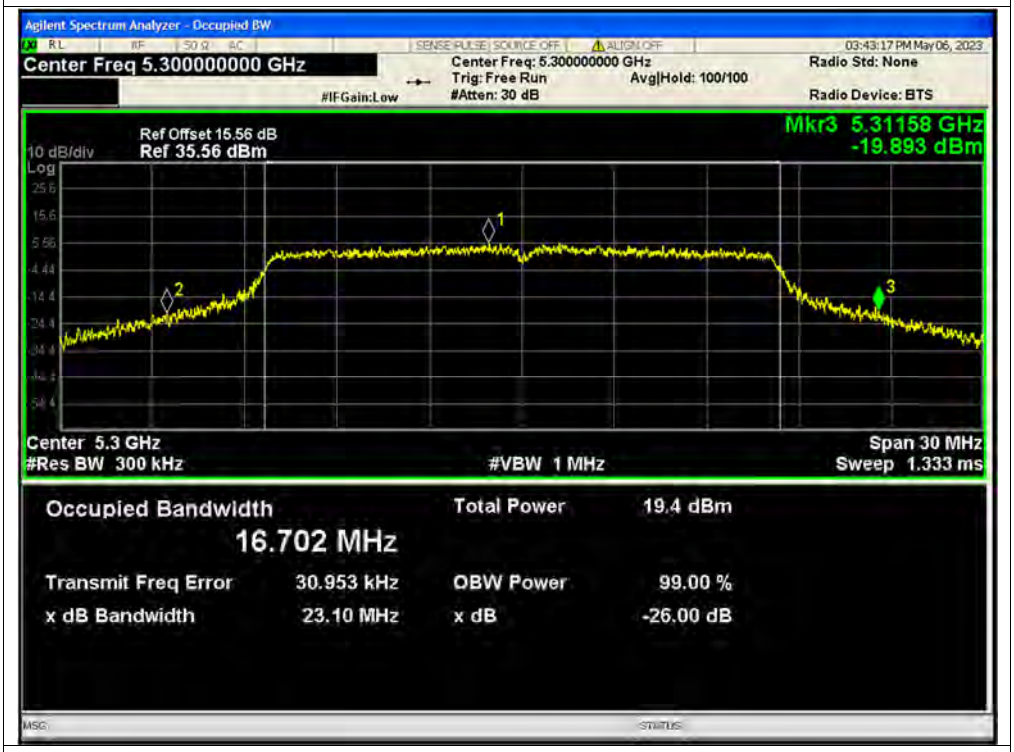
-26dB Bandwidth NVNT a 5240MHz Ant1



-26dB Bandwidth NVNT a 5260MHz Ant1

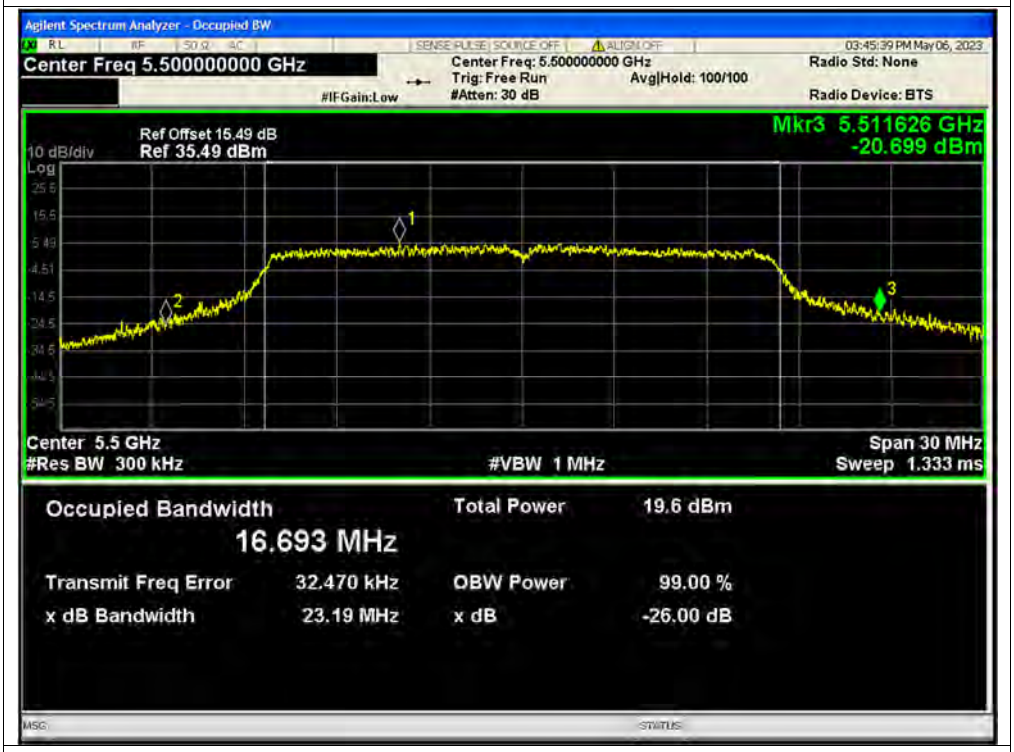


-26dB Bandwidth NVNT a 5300MHz Ant1

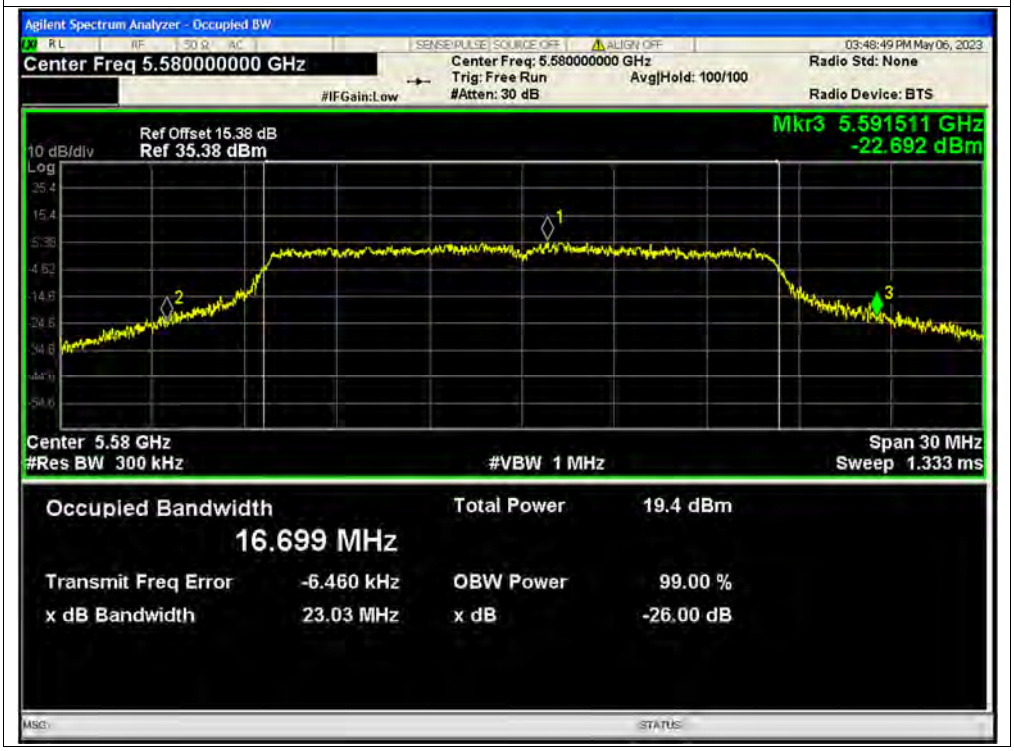


-26dB Bandwidth NVNT a 5320MHz Ant1

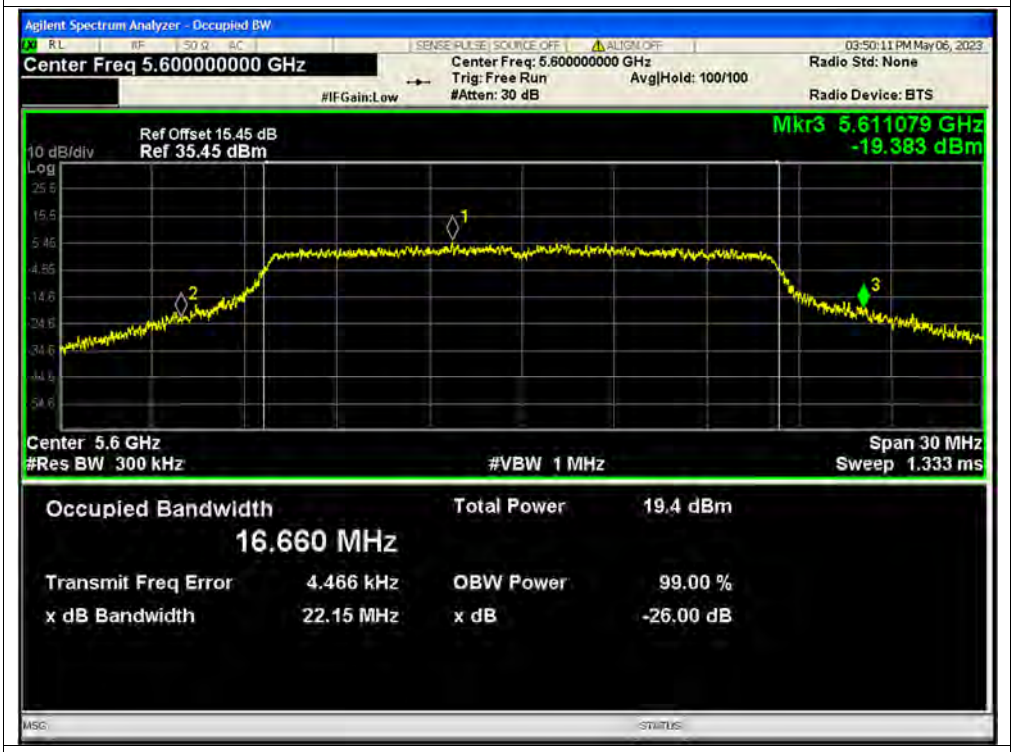
-26dB Bandwidth NVNT a 5500MHz Ant1



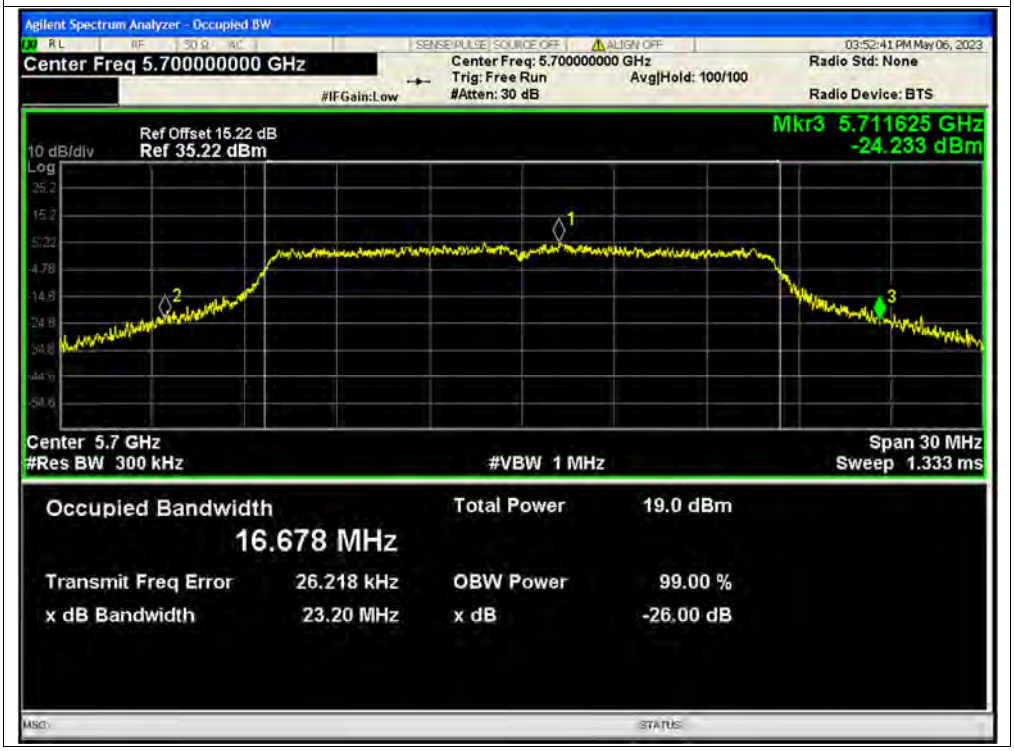
-26dB Bandwidth NVNT a 5580MHz Ant1



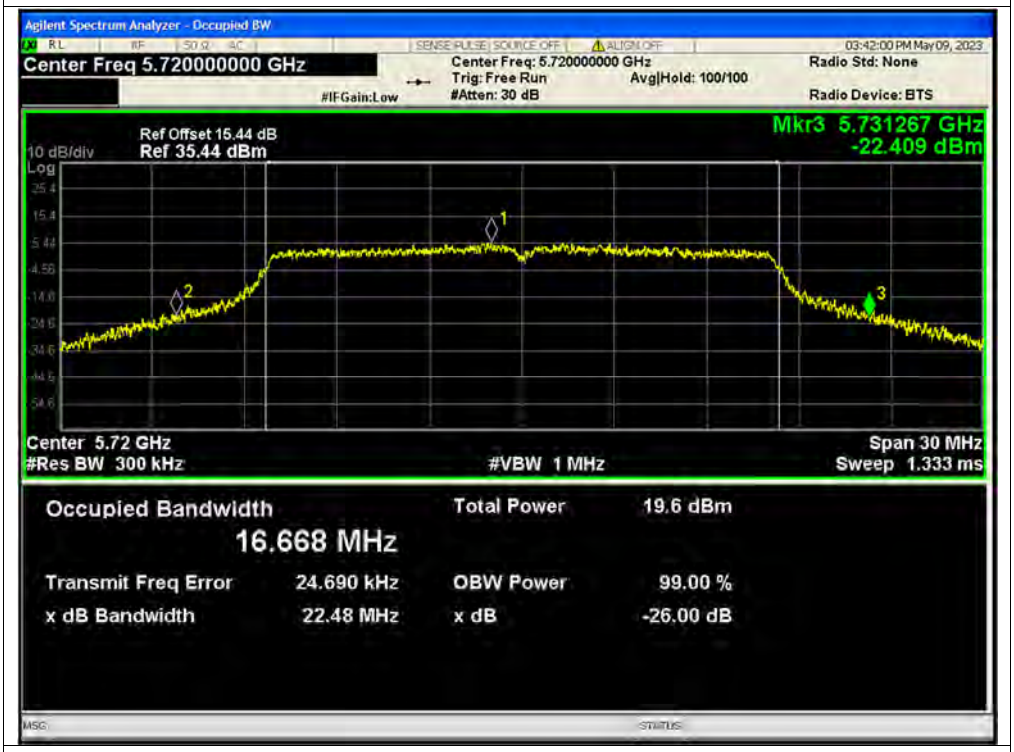
-26dB Bandwidth NVNT a 5600MHz Ant1



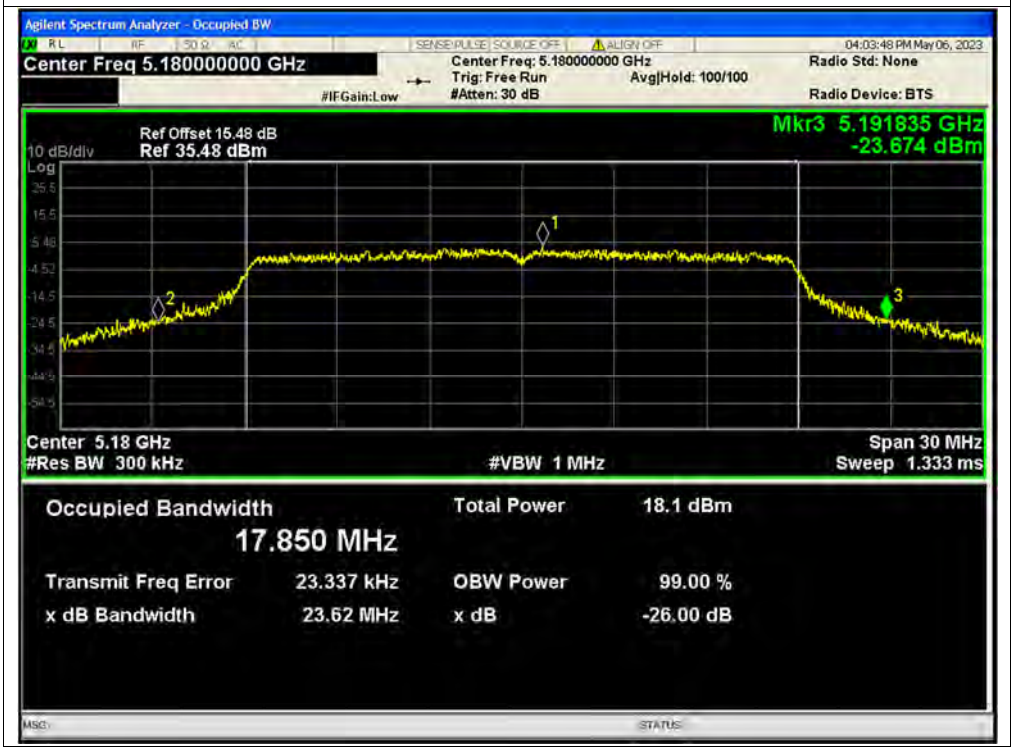
-26dB Bandwidth NVNT a 5700MHz Ant1



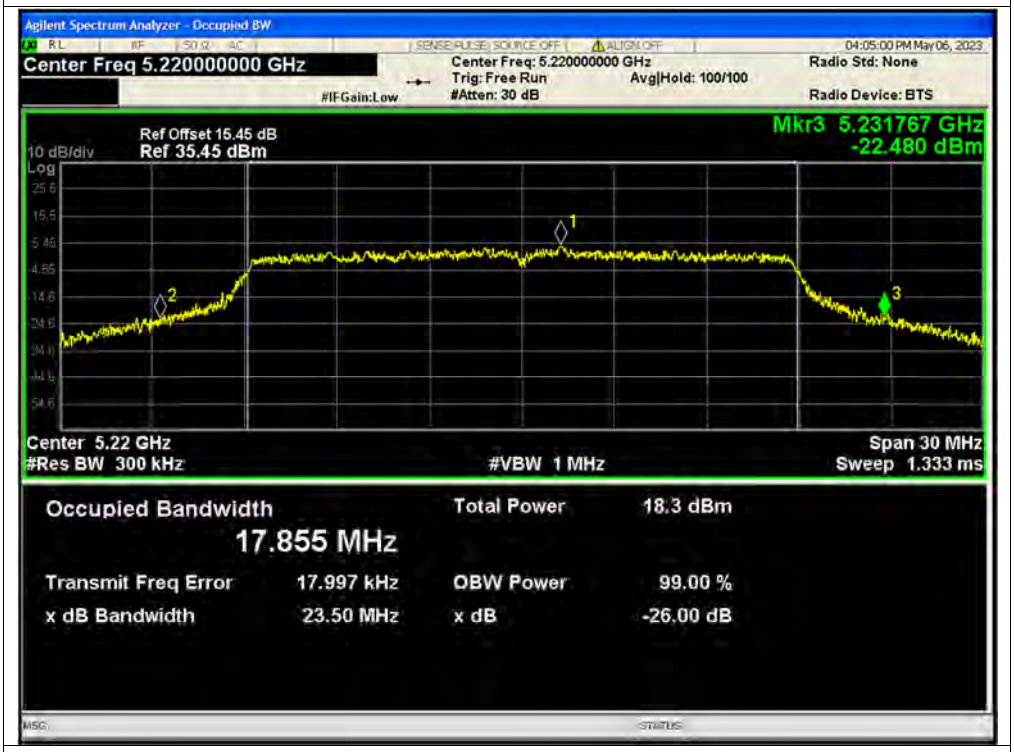
-26dB Bandwidth NVNT a 5720MHz Ant1



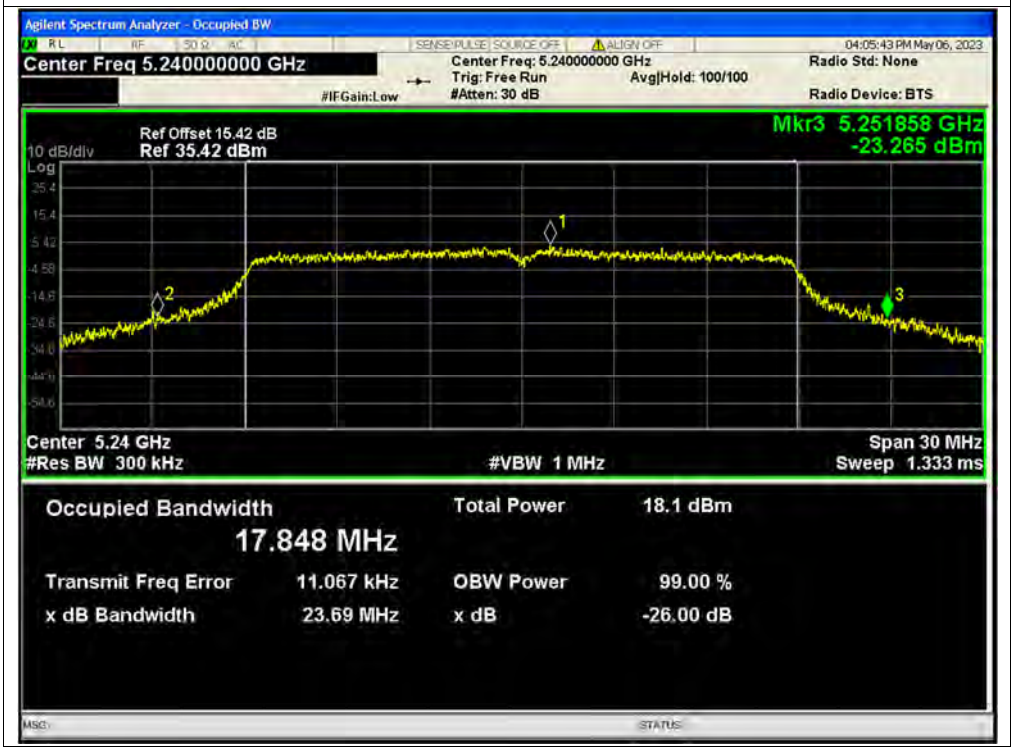
-26dB Bandwidth NVNT n20 5180MHz Ant1



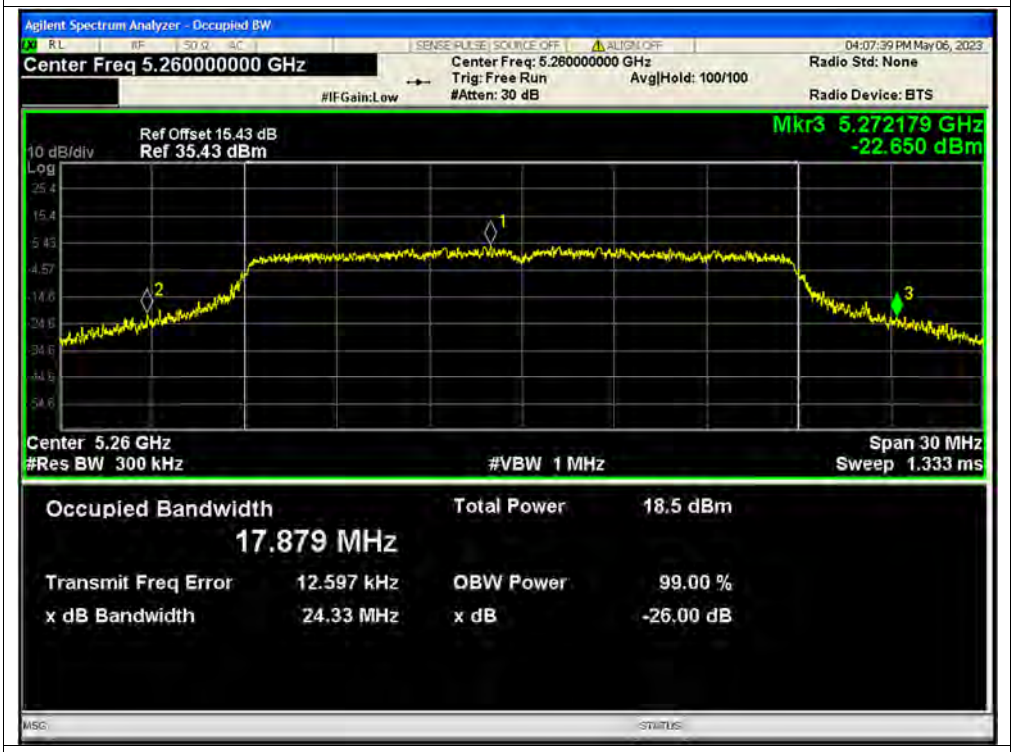
-26dB Bandwidth NVNT n20 5220MHz Ant1



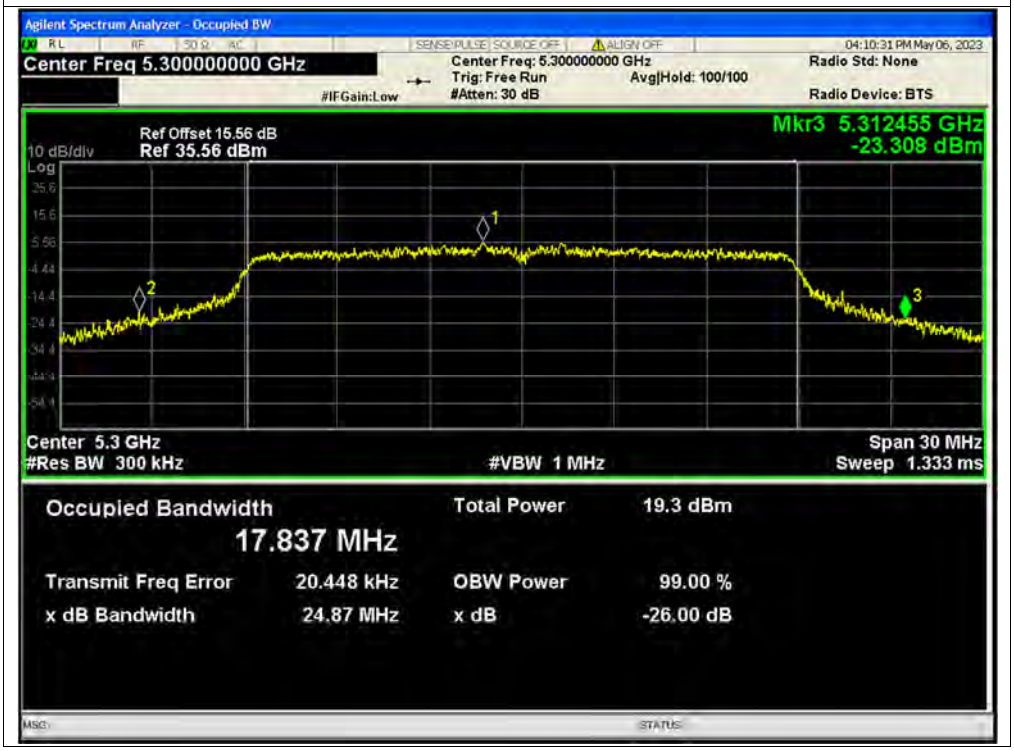
-26dB Bandwidth NVNT n20 5240MHz Ant1



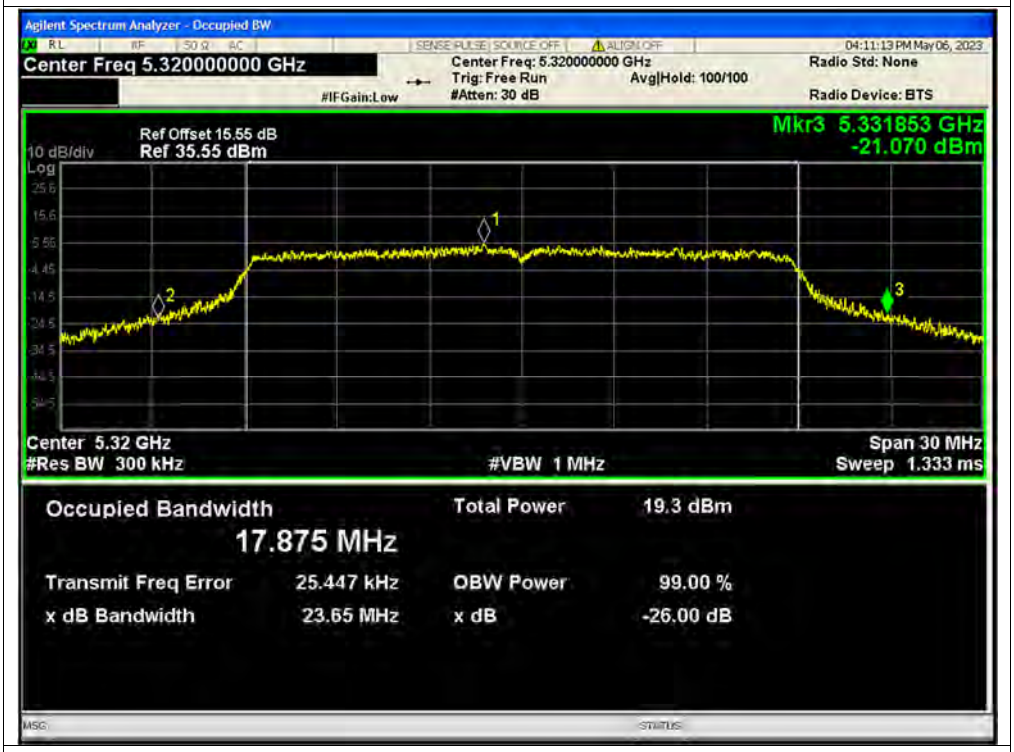
-26dB Bandwidth NVNT n20 5260MHz Ant1



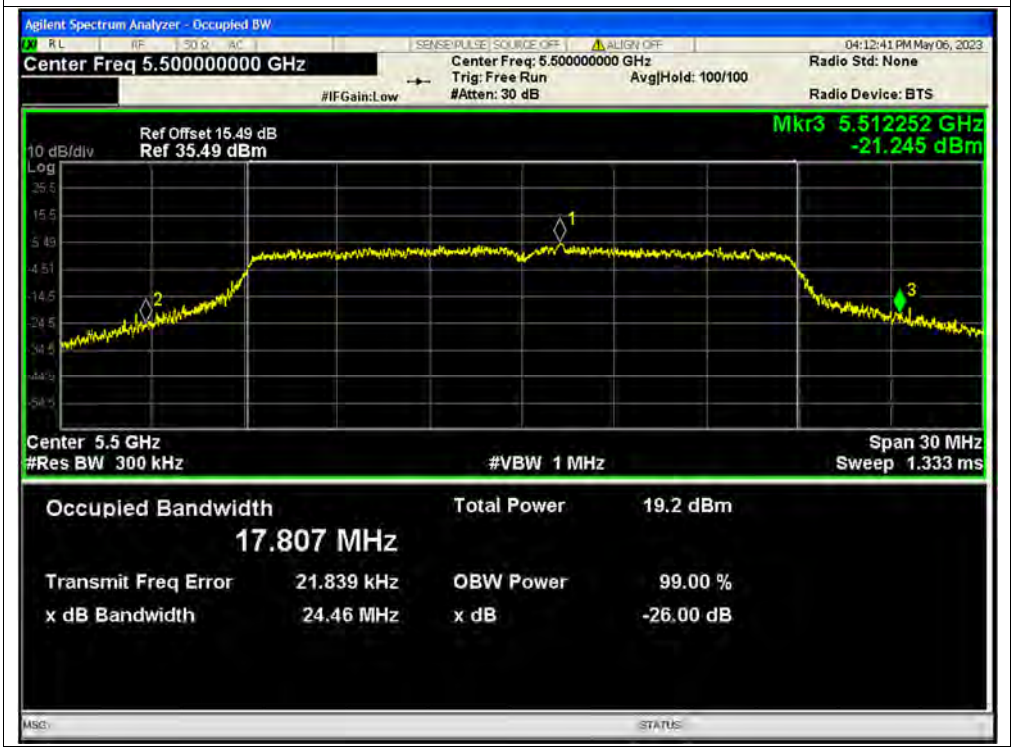
-26dB Bandwidth NVNT n20 5300MHz Ant1



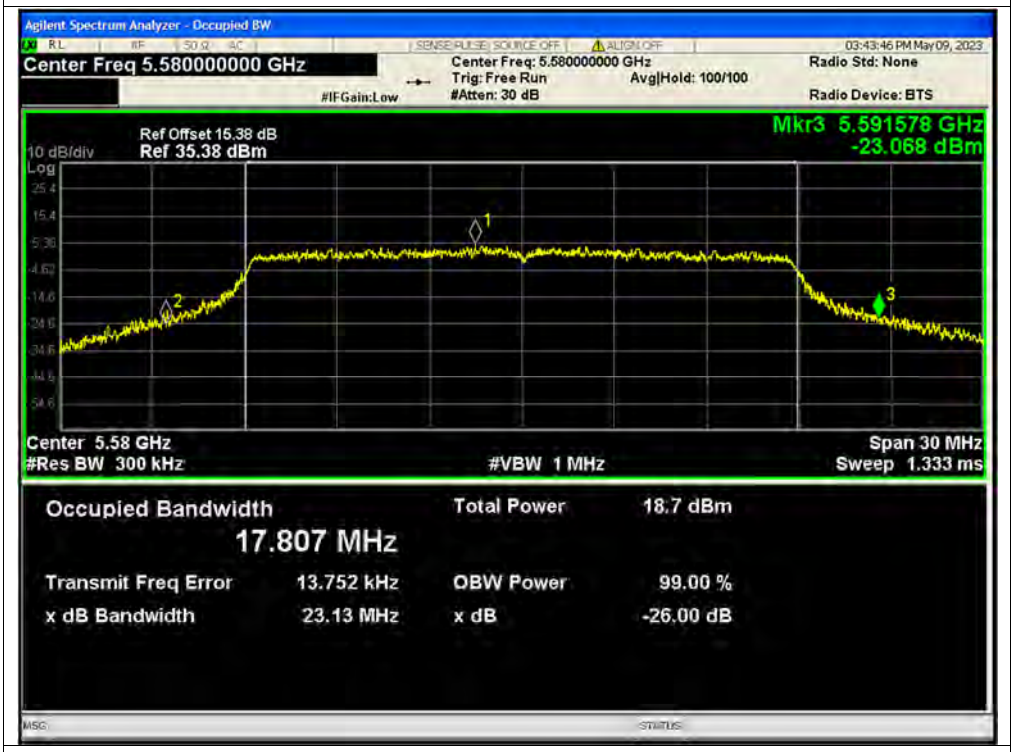
-26dB Bandwidth NVNT n20 5320MHz Ant1



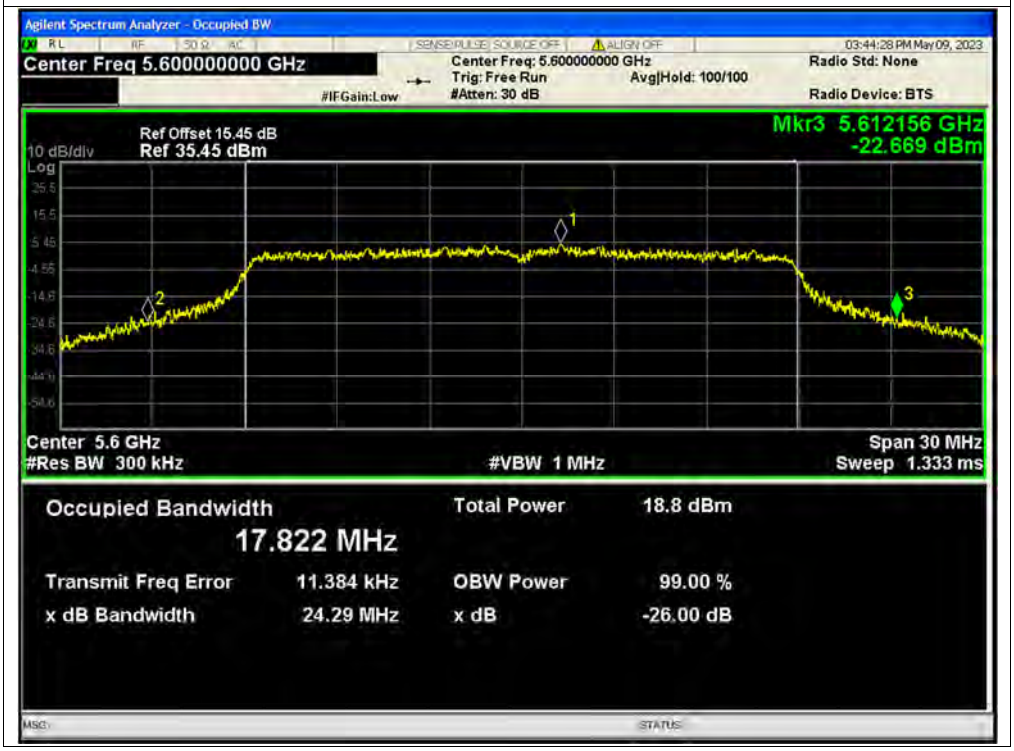
-26dB Bandwidth NVNT n20 5500MHz Ant1



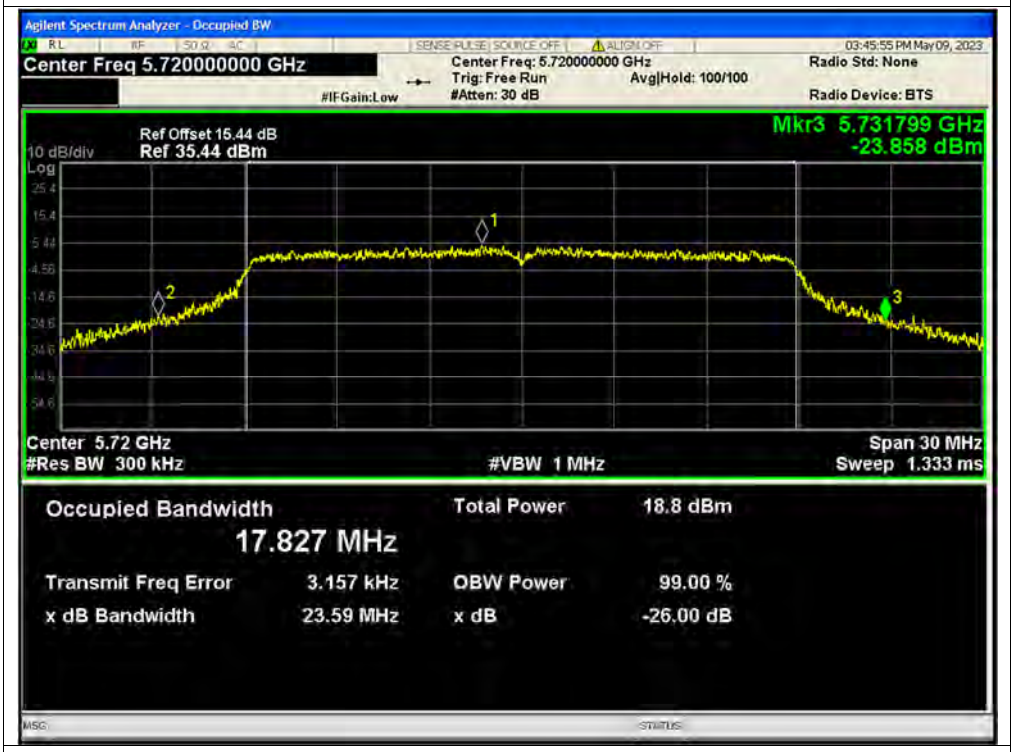
-26dB Bandwidth NVNT n20 5580MHz Ant1



-26dB Bandwidth NVNT n20 5600MHz Ant1

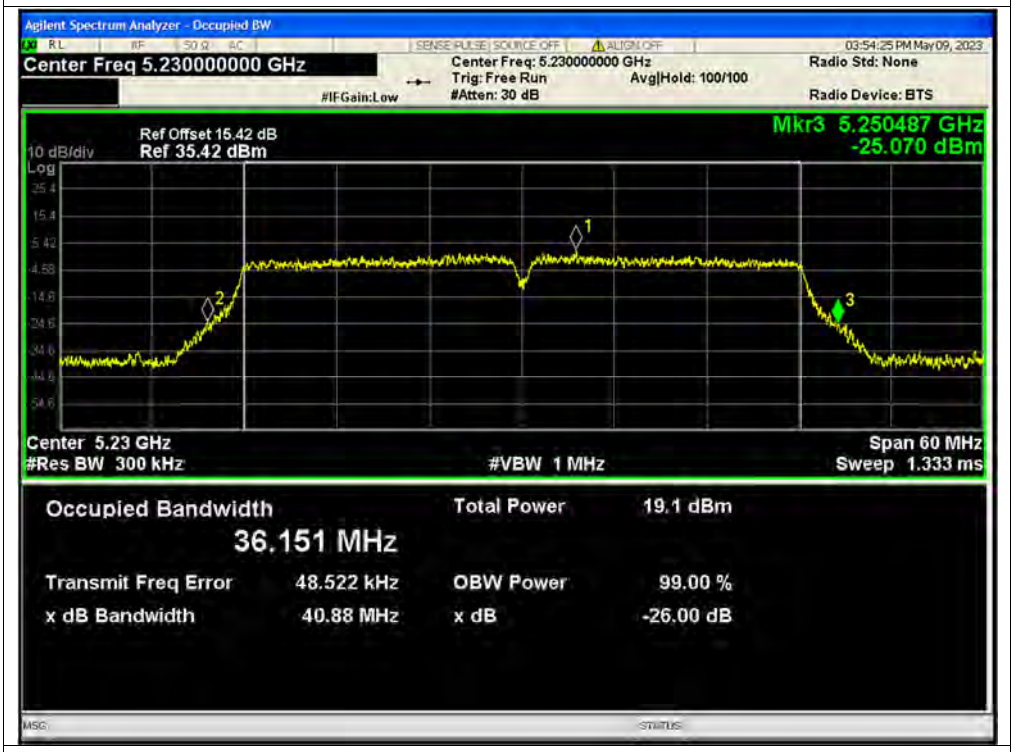


-26dB Bandwidth NVNT n20 5720MHz Ant1

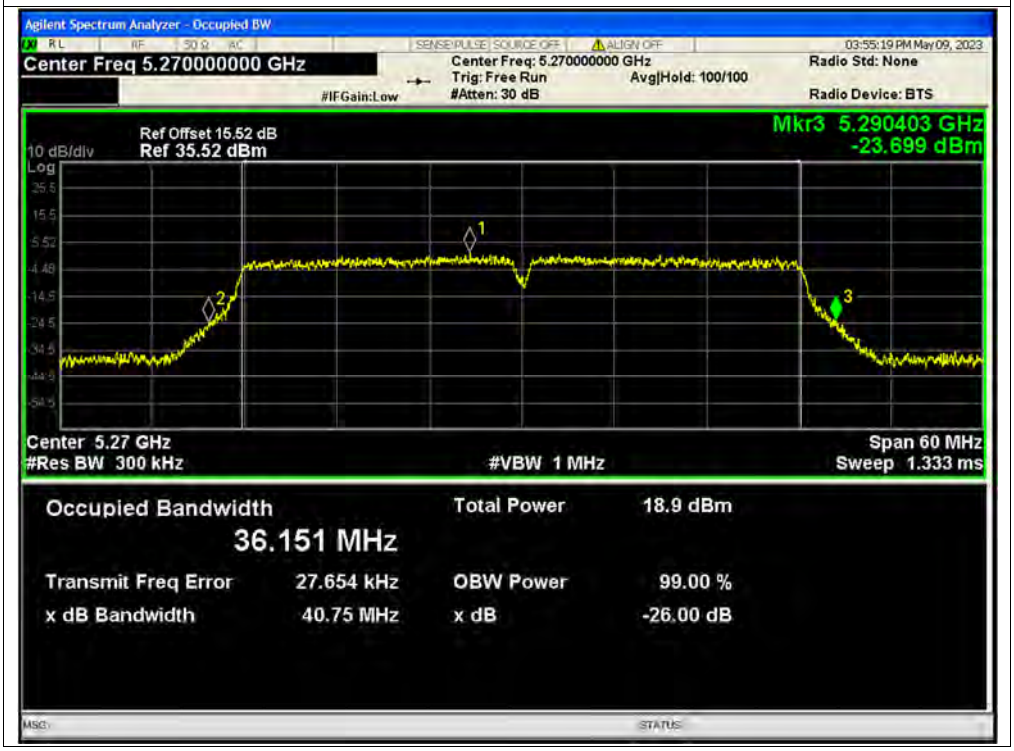


-26dB Bandwidth NVNT n40 5190MHz Ant1

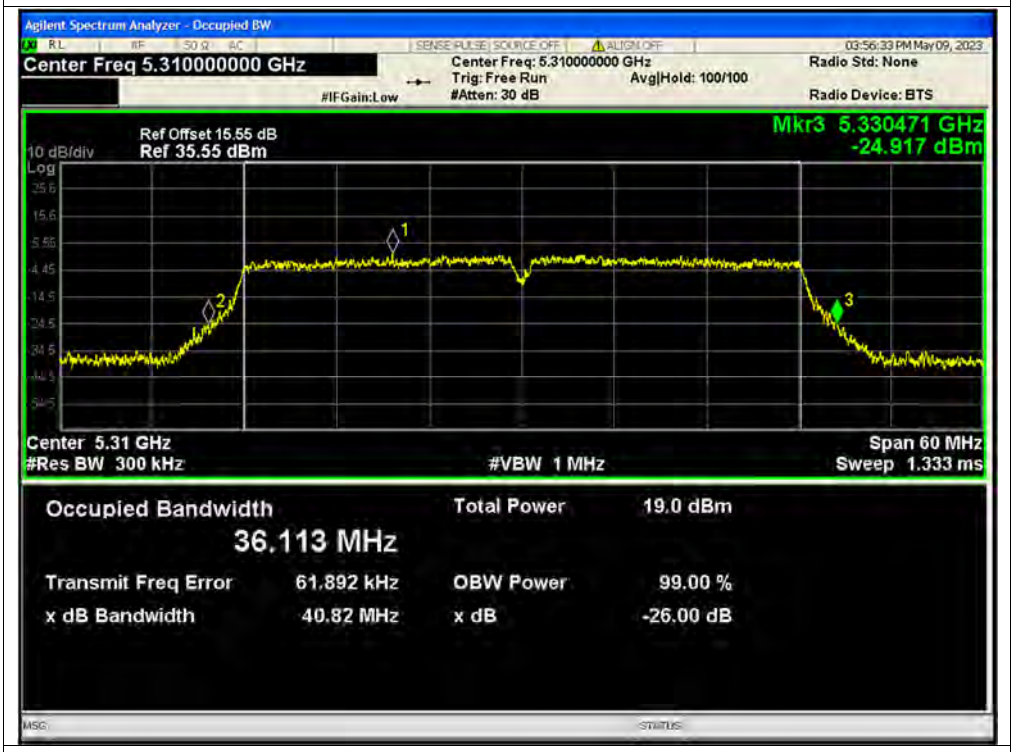
-26dB Bandwidth NVNT n40 5230MHz Ant1



-26dB Bandwidth NVNT n40 5270MHz Ant1

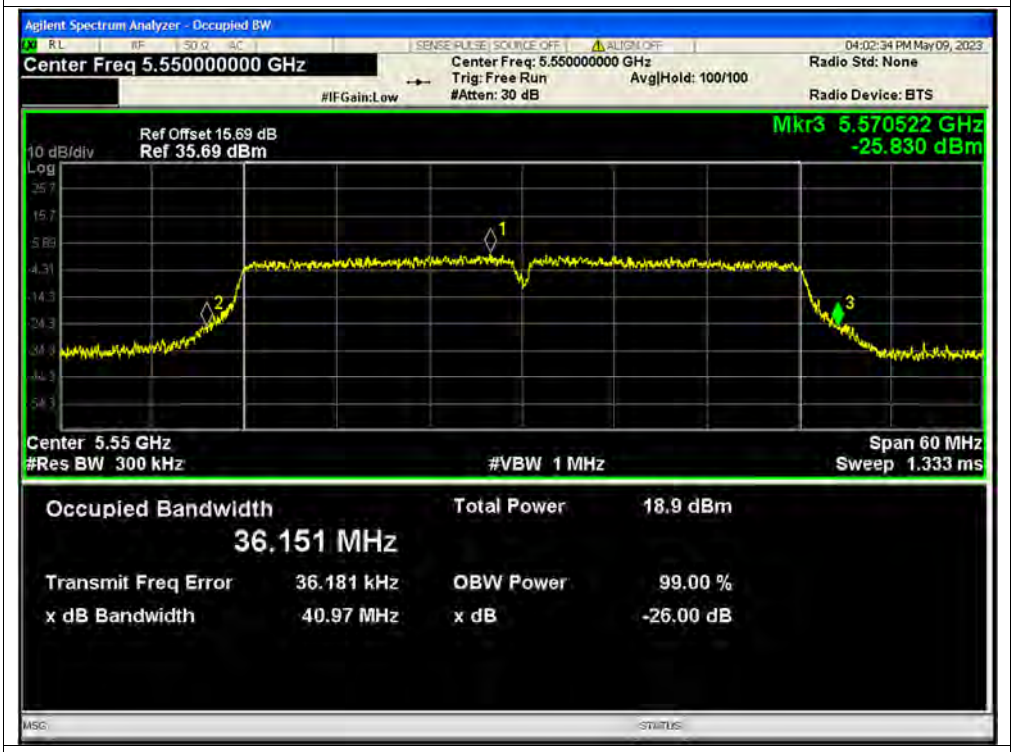


-26dB Bandwidth NVNT n40 5310MHz Ant1



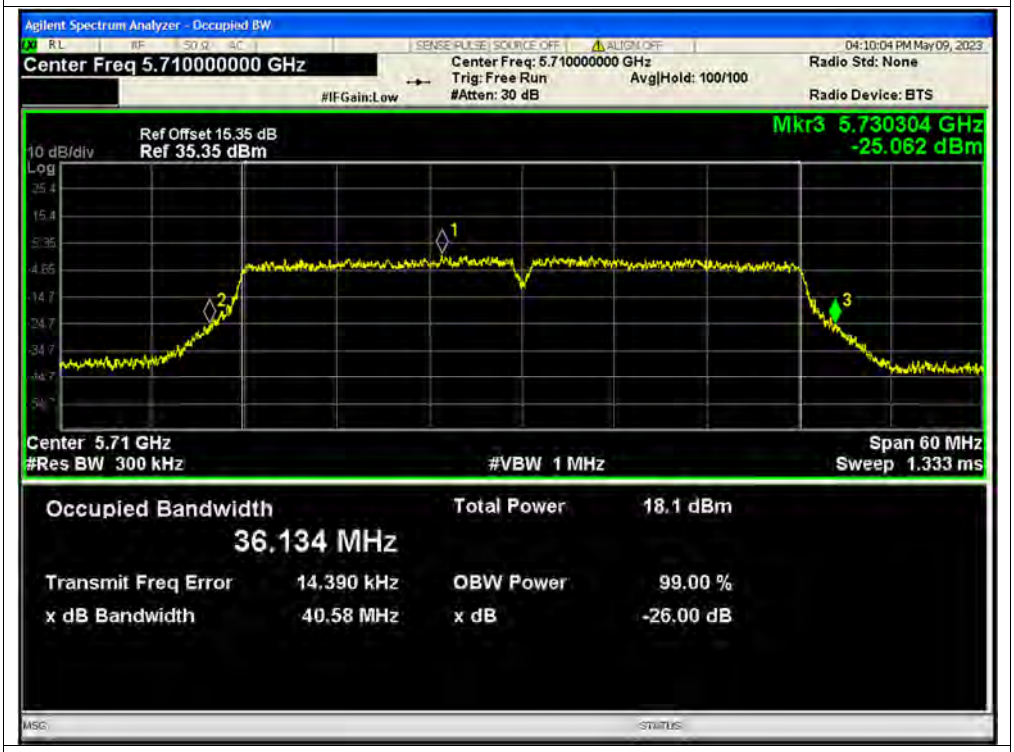
-26dB Bandwidth NVNT n40 5510MHz Ant1

-26dB Bandwidth NVNT n40 5550MHz Ant1

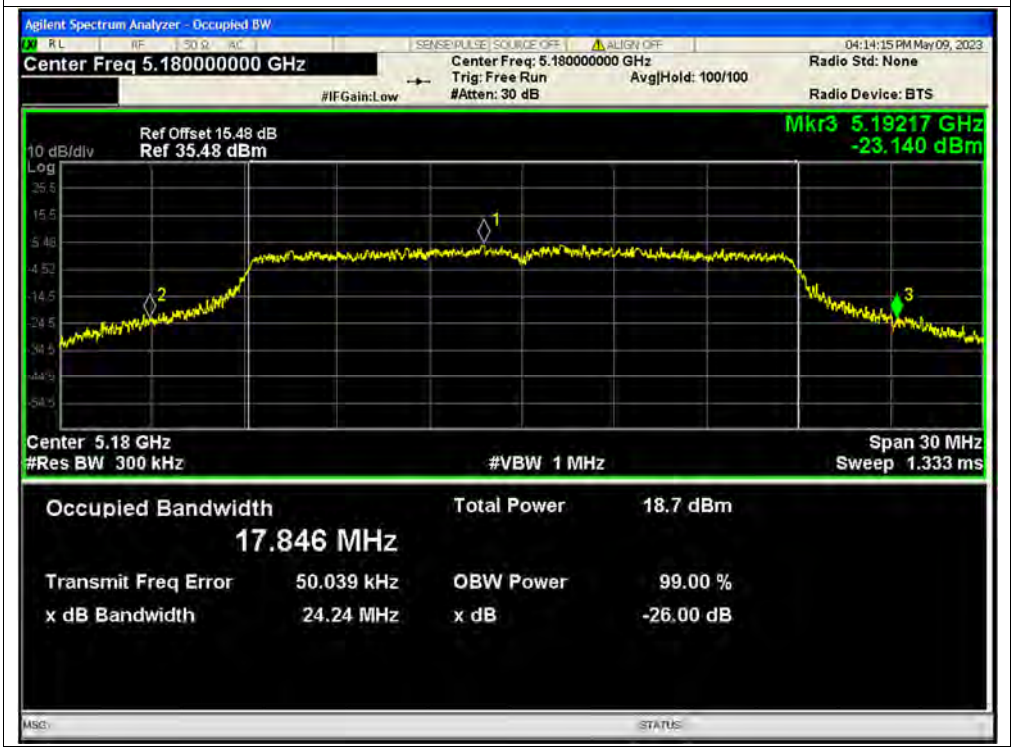


-26dB Bandwidth NVNT n40 5630MHz Ant1

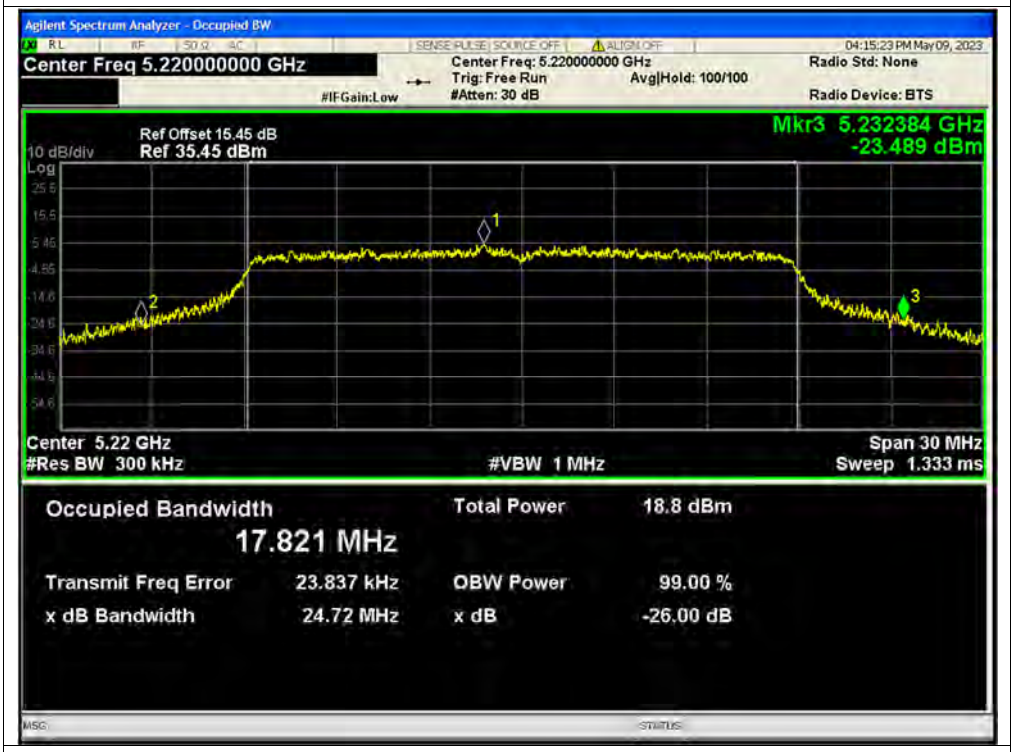
-26dB Bandwidth NVNT n40 5710MHz Ant1



-26dB Bandwidth NVNT ac20 5180MHz Ant1

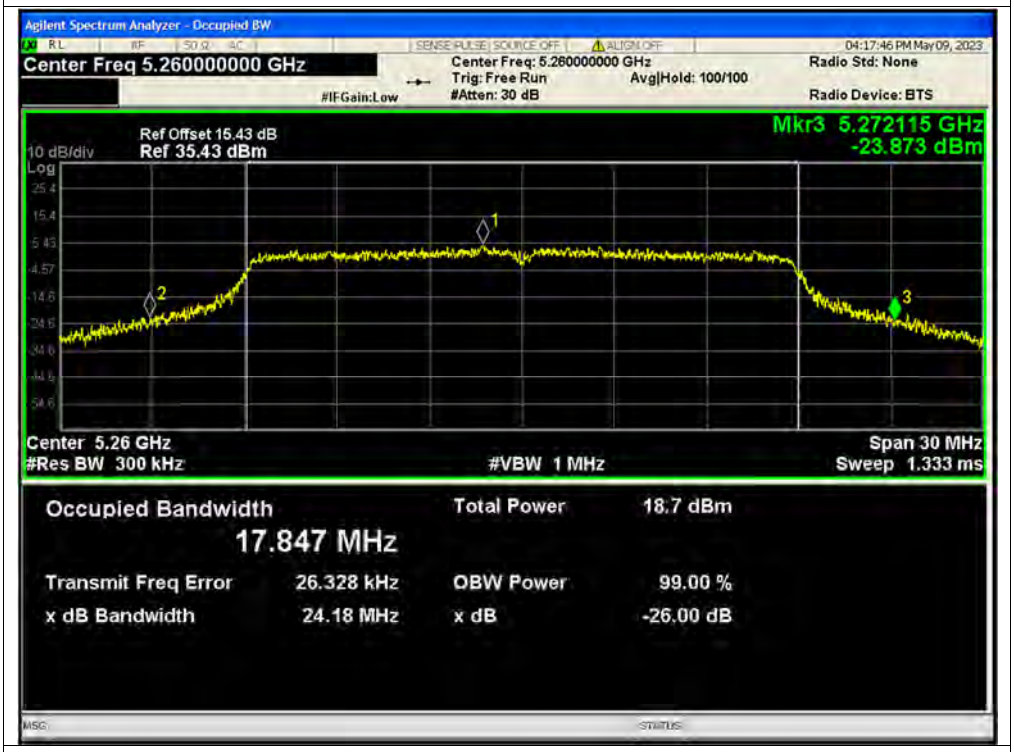


-26dB Bandwidth NVNT ac20 5220MHz Ant1

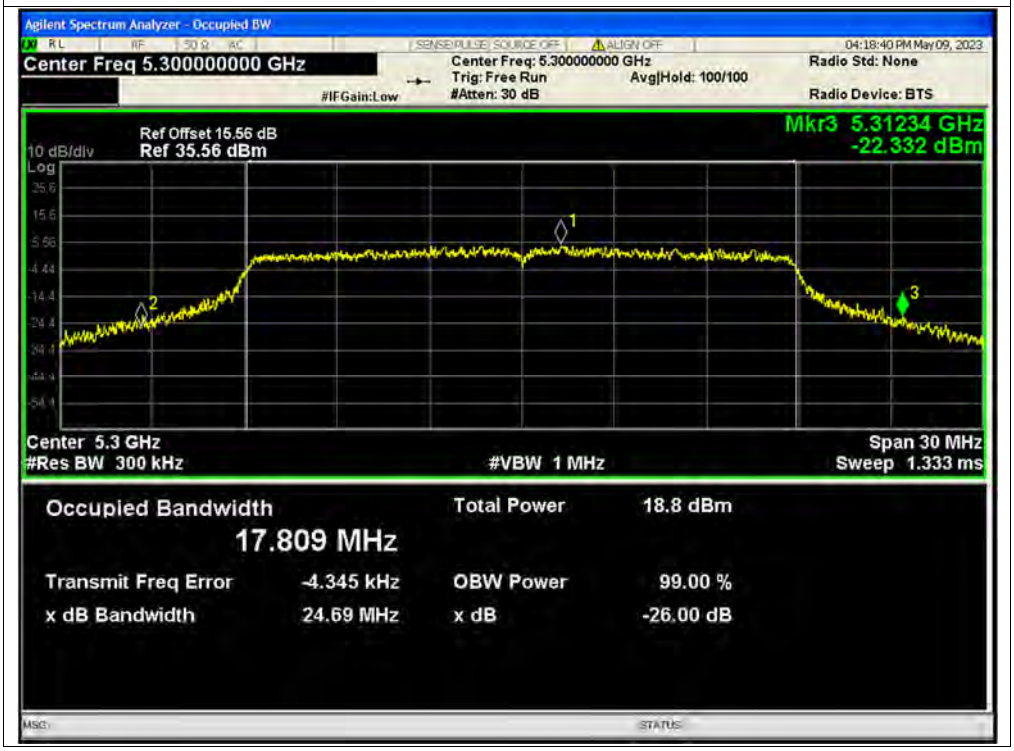


-26dB Bandwidth NVNT ac20 5240MHz Ant1

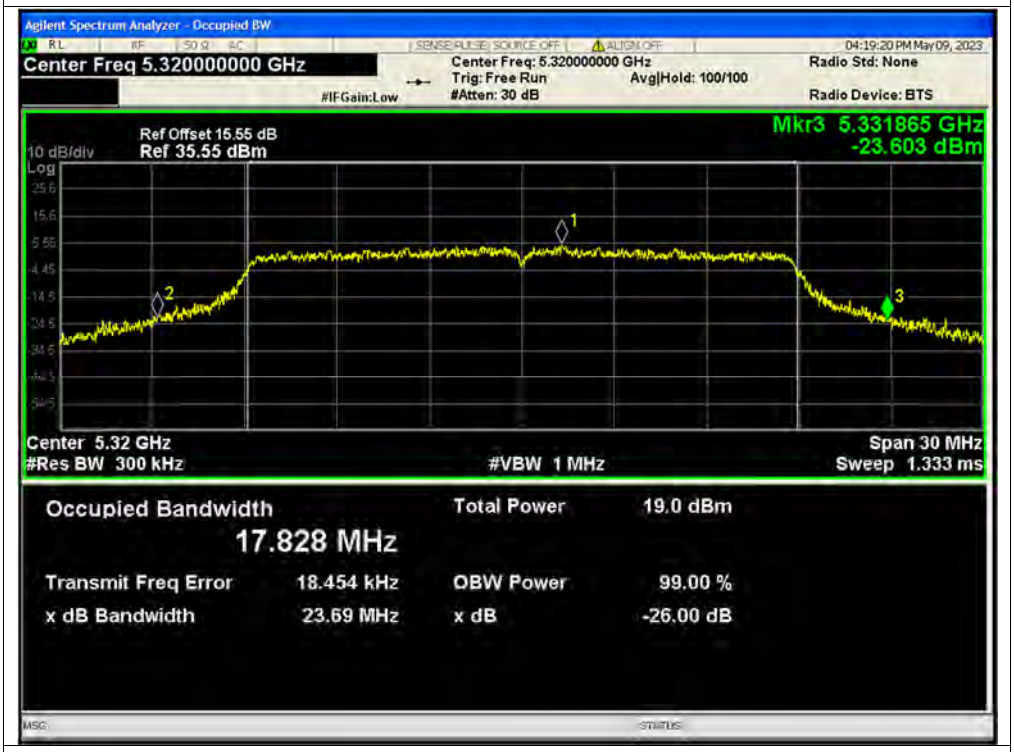
-26dB Bandwidth NVNT ac20 5260MHz Ant1



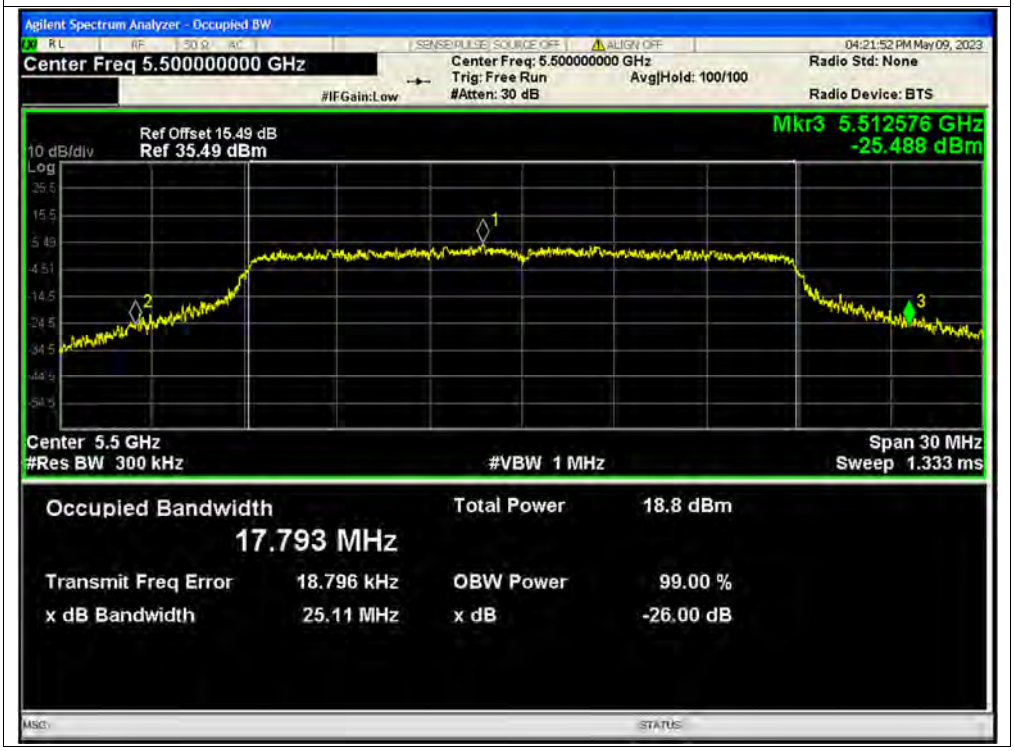
-26dB Bandwidth NVNT ac20 5300MHz Ant1



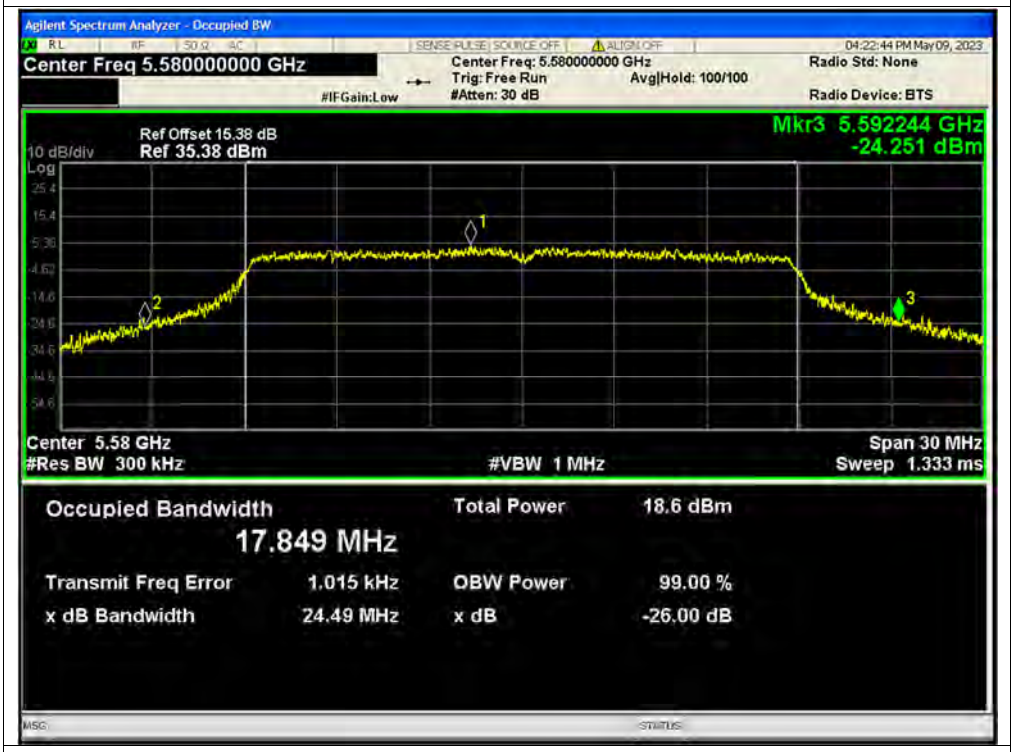
-26dB Bandwidth NVNT ac20 5320MHz Ant1



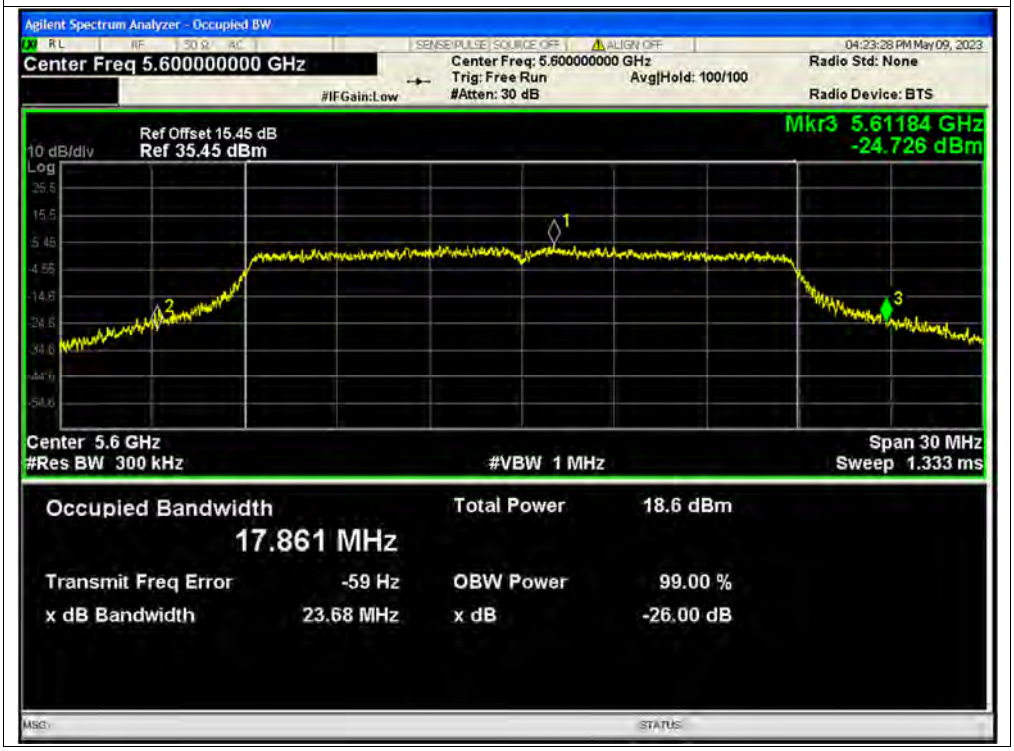
-26dB Bandwidth NVNT ac20 5500MHz Ant1



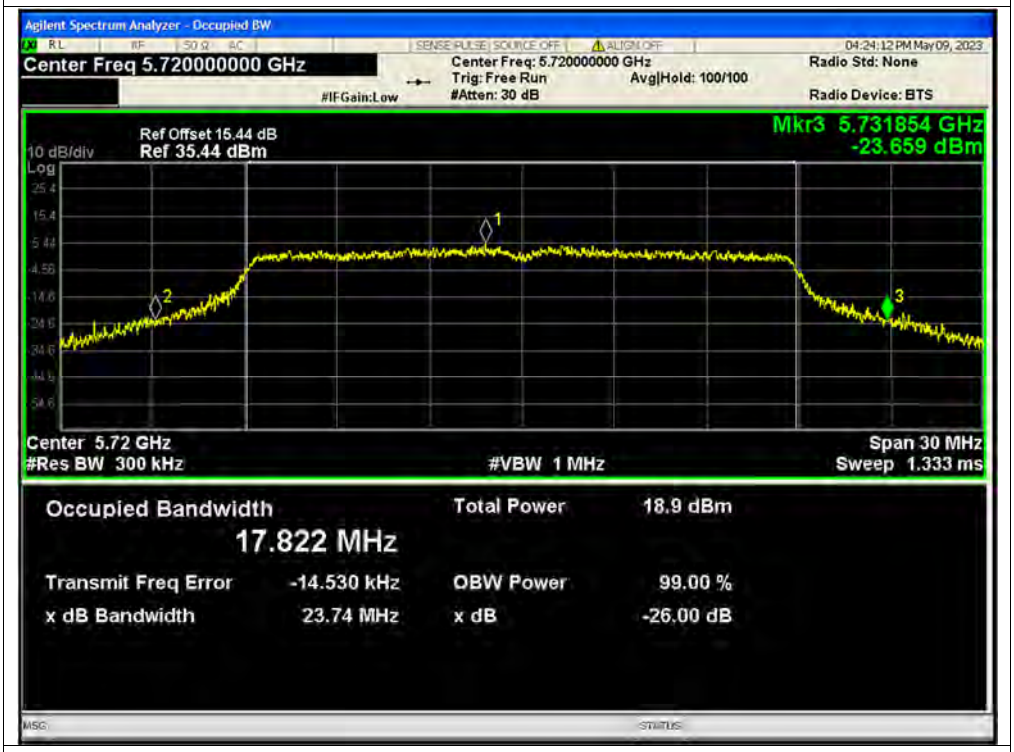
-26dB Bandwidth NVNT ac20 5580MHz Ant1



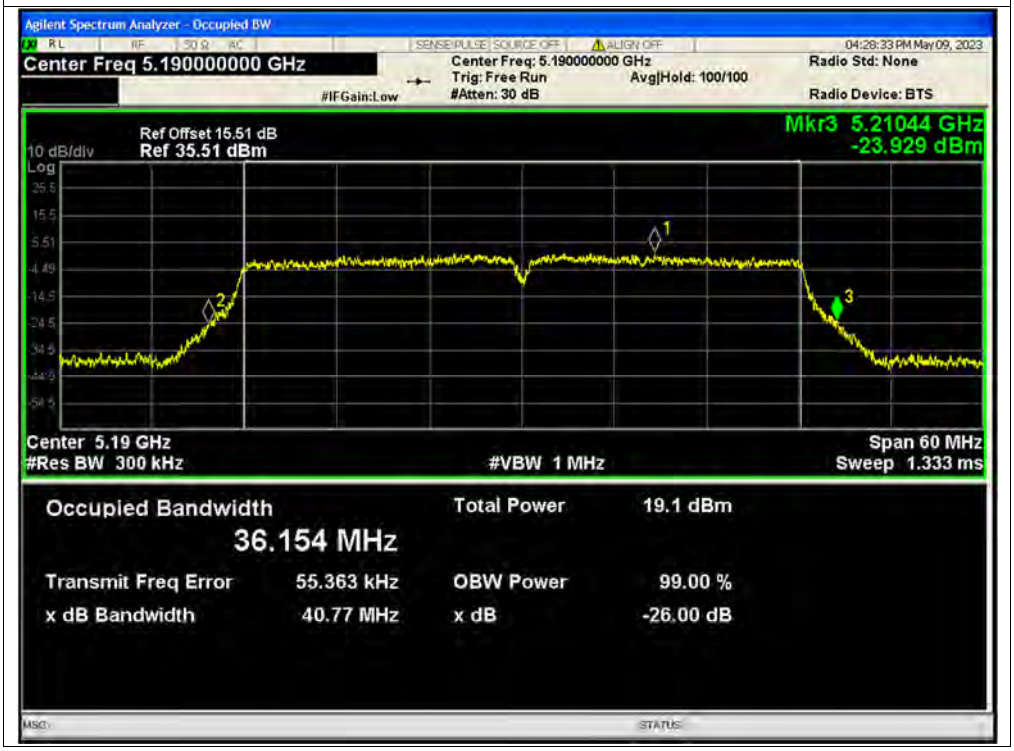
-26dB Bandwidth NVNT ac20 5600MHz Ant1



-26dB Bandwidth NVNT ac20 5720MHz Ant1

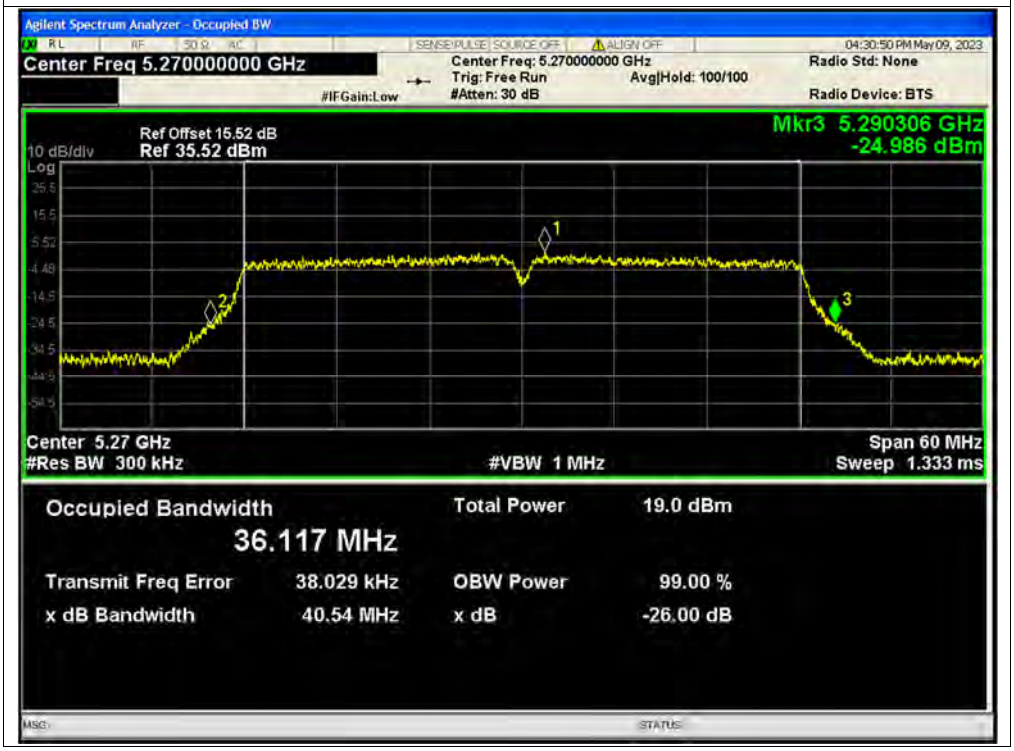


-26dB Bandwidth NVNT ac40 5190MHz Ant1

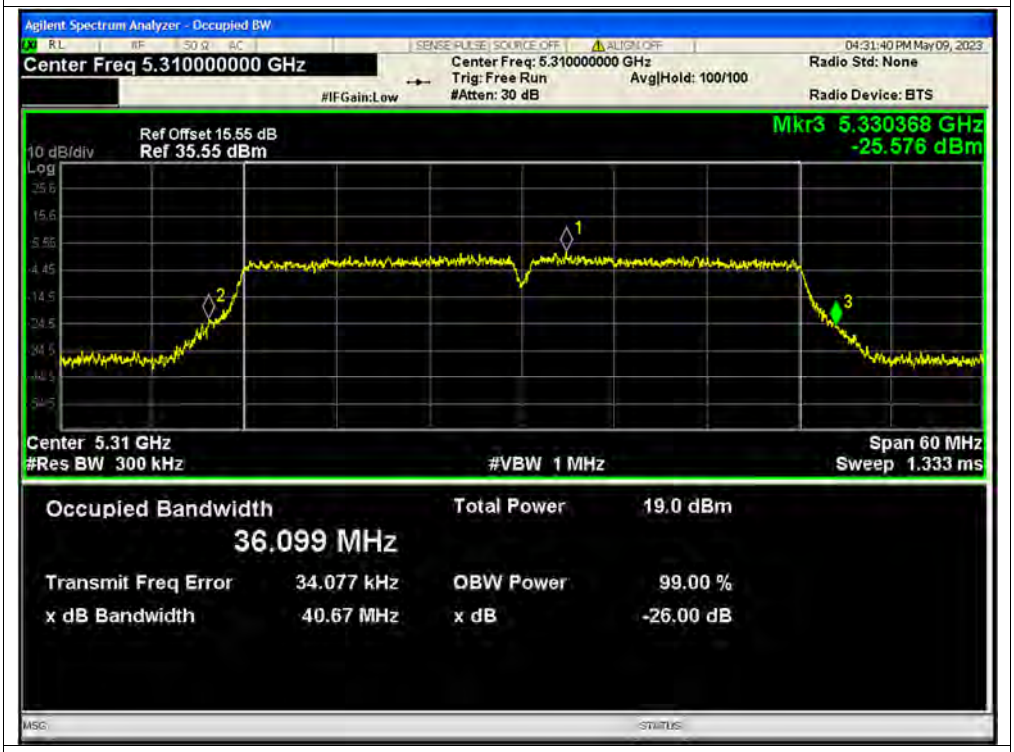


-26dB Bandwidth NVNT ac40 5230MHz Ant1

-26dB Bandwidth NVNT ac40 5270MHz Ant1

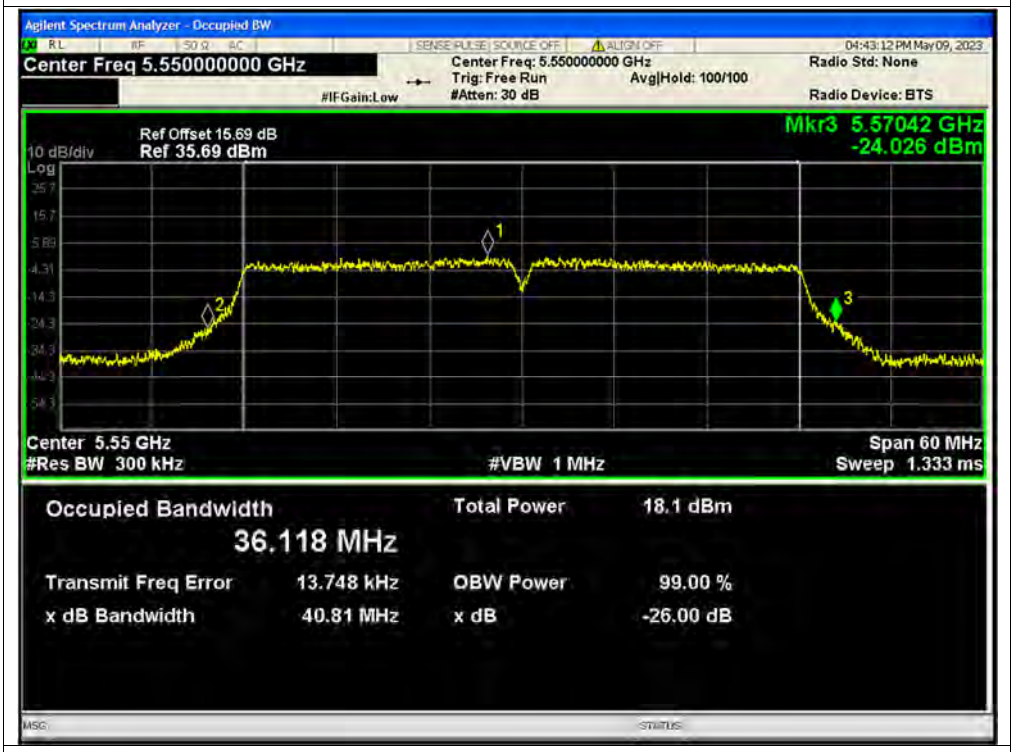


-26dB Bandwidth NVNT ac40 5310MHz Ant1



-26dB Bandwidth NVNT ac40 5510MHz Ant1

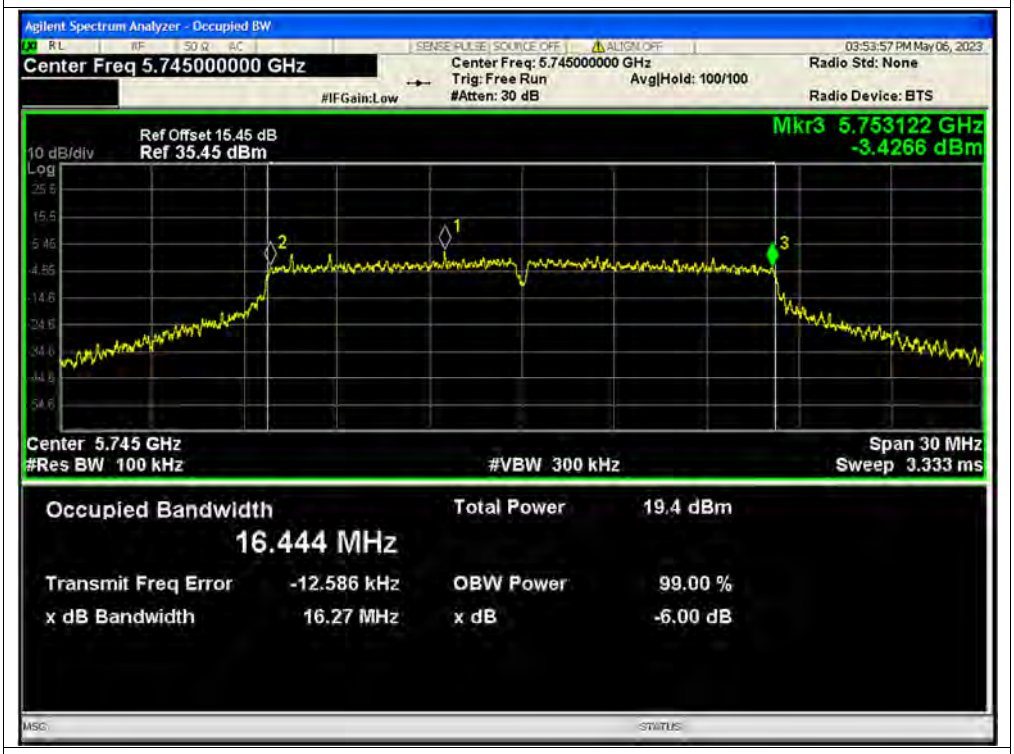
-26dB Bandwidth NVNT ac40 5550MHz Ant1



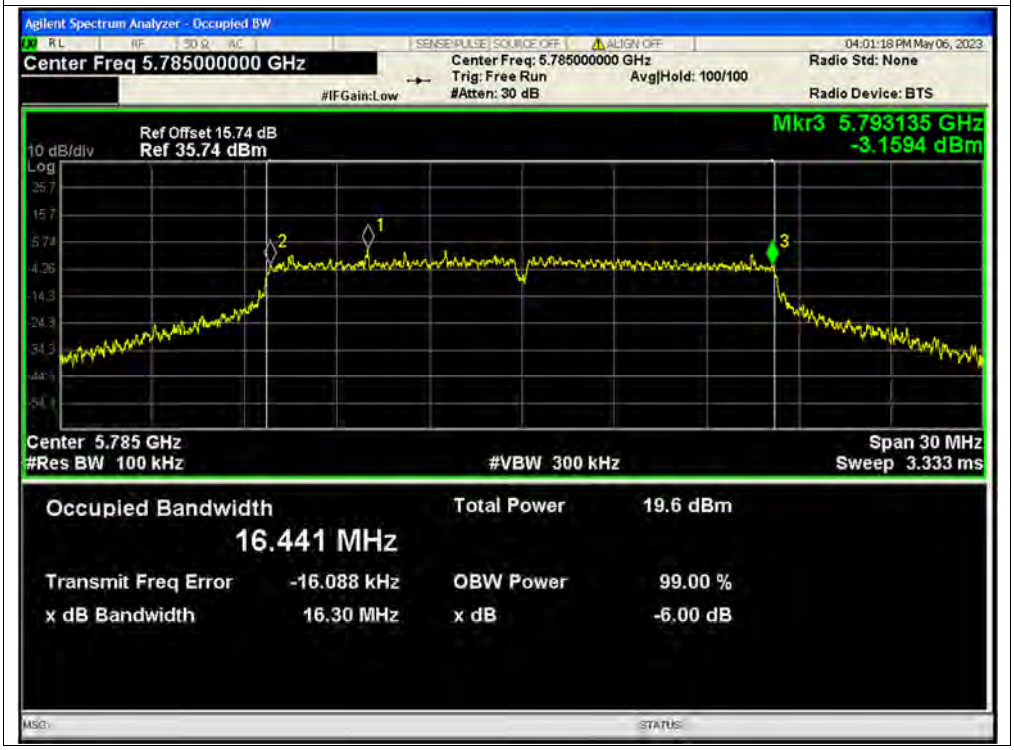
-26dB Bandwidth NVNT ac40 5630MHz Ant1

-26dB Bandwidth NVNT ac40 5710MHz Ant1

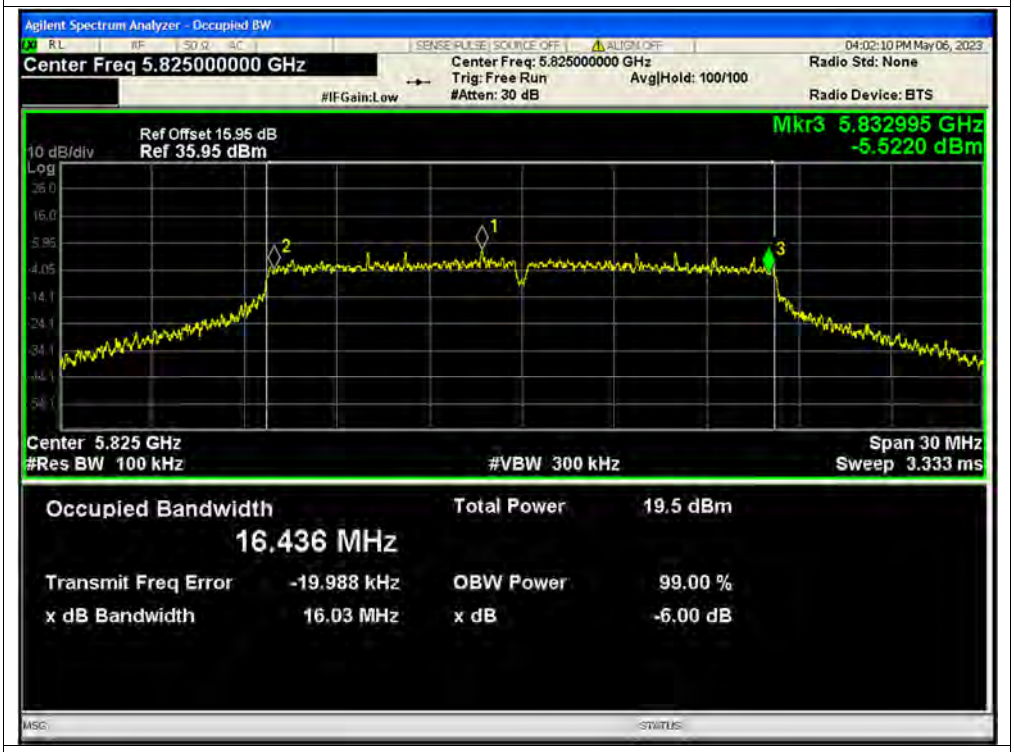
Test Graphs
-6dB Bandwidth NVNT a 5745MHz Ant1



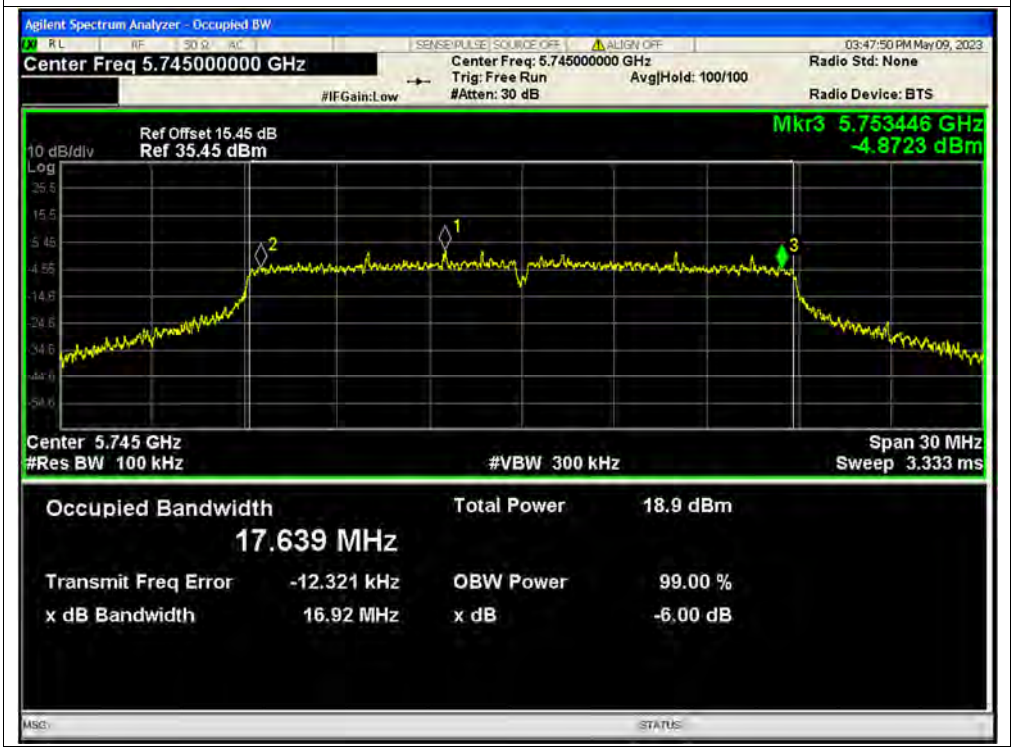
-6dB Bandwidth NVNT a 5785MHz Ant1



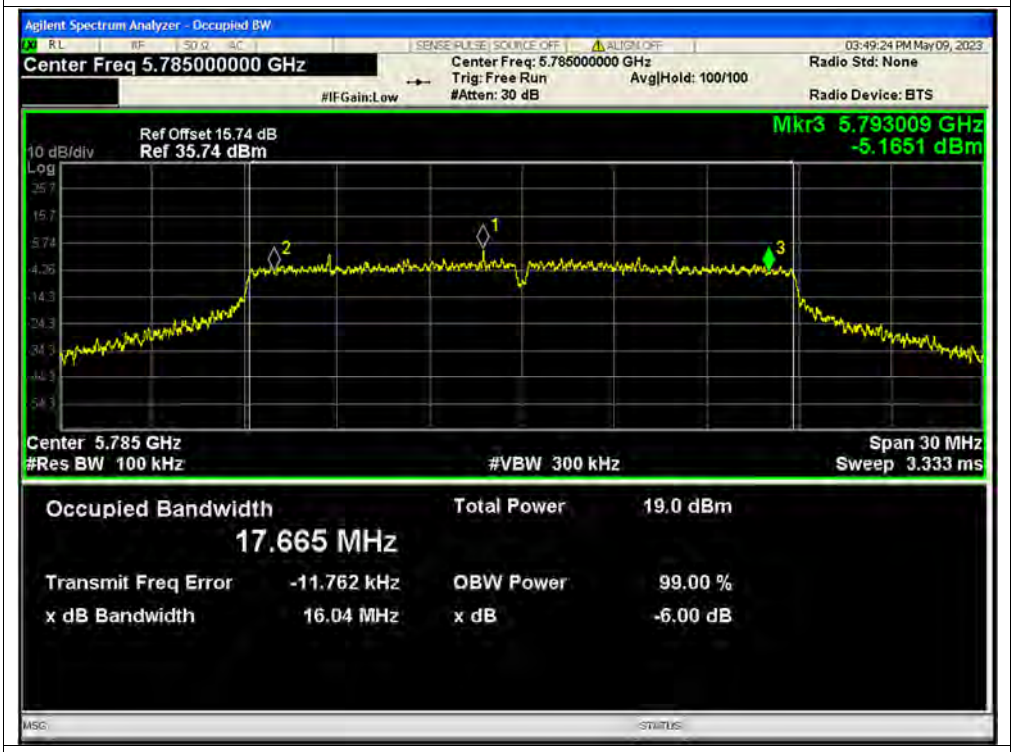
-6dB Bandwidth NVNT a 5825MHz Ant1



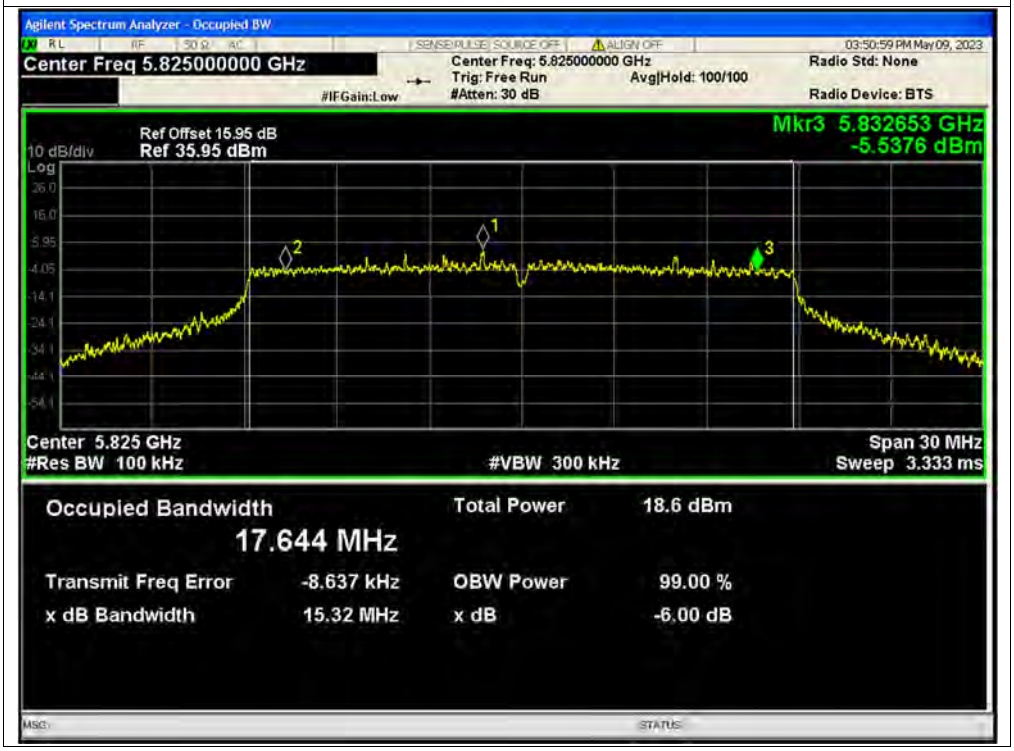
-6dB Bandwidth NVNT n20 5745MHz Ant1



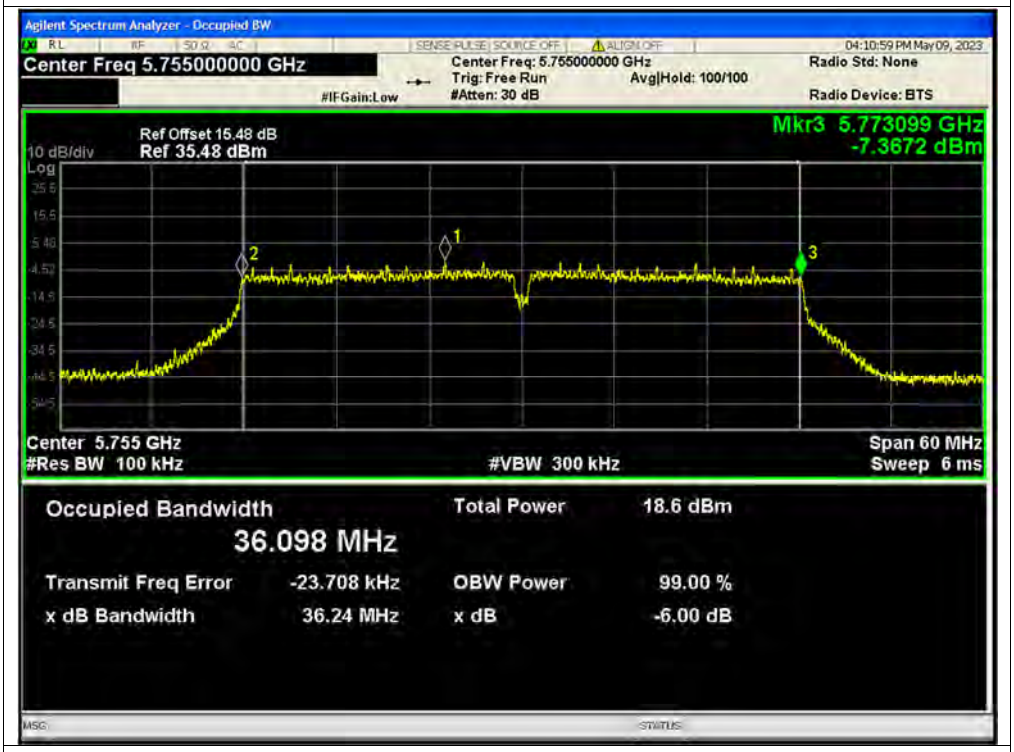
-6dB Bandwidth NVNT n20 5785MHz Ant1



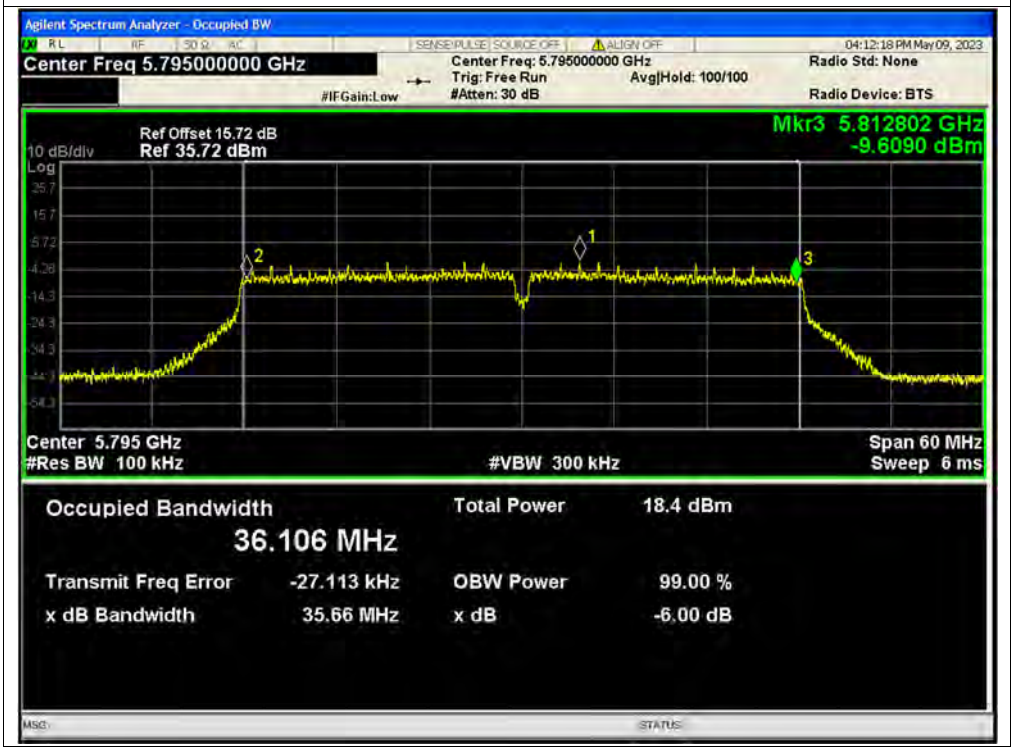
-6dB Bandwidth NVNT n20 5825MHz Ant1



-6dB Bandwidth NVNT n40 5755MHz Ant1

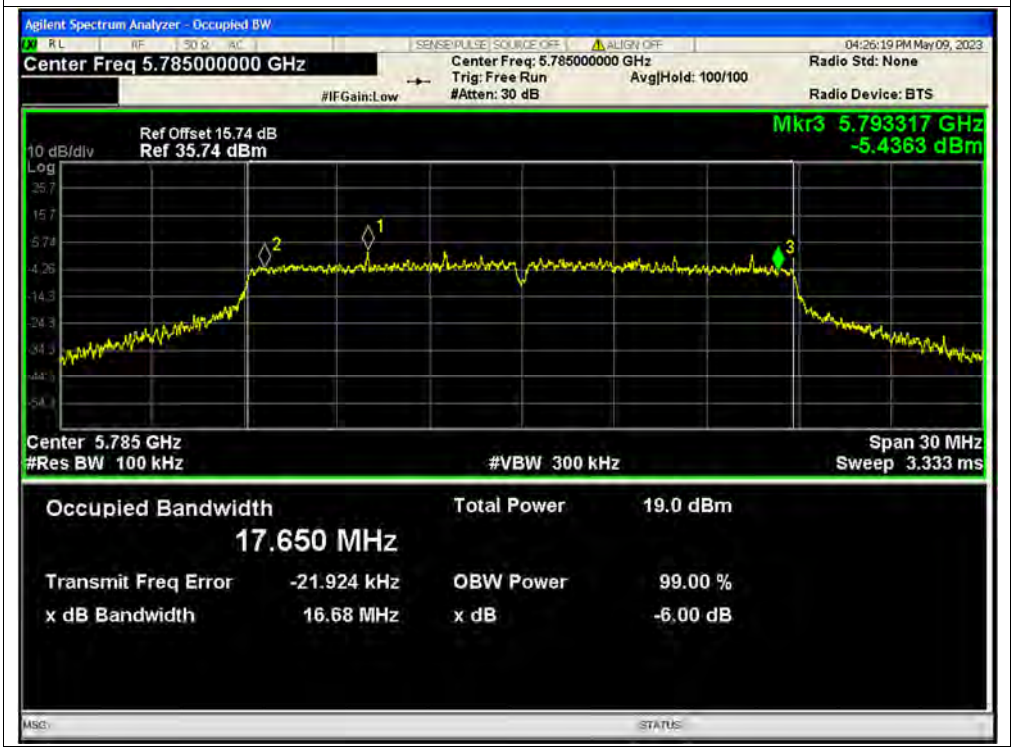


-6dB Bandwidth NVNT n40 5795MHz Ant1

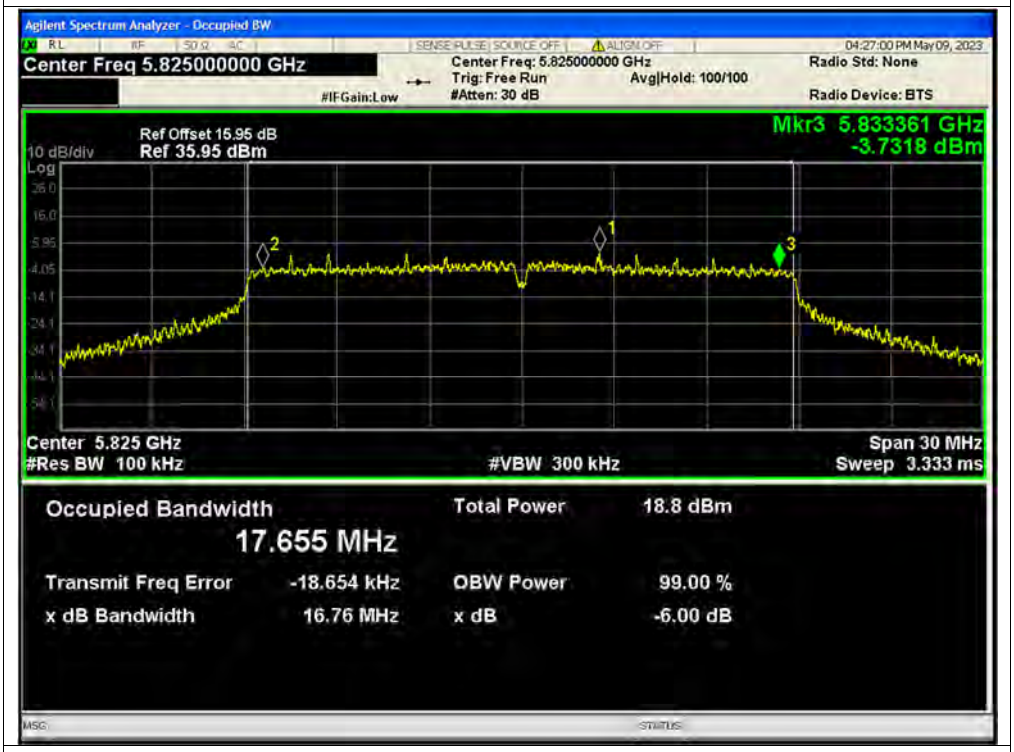


-6dB Bandwidth NVNT ac20 5745MHz Ant1

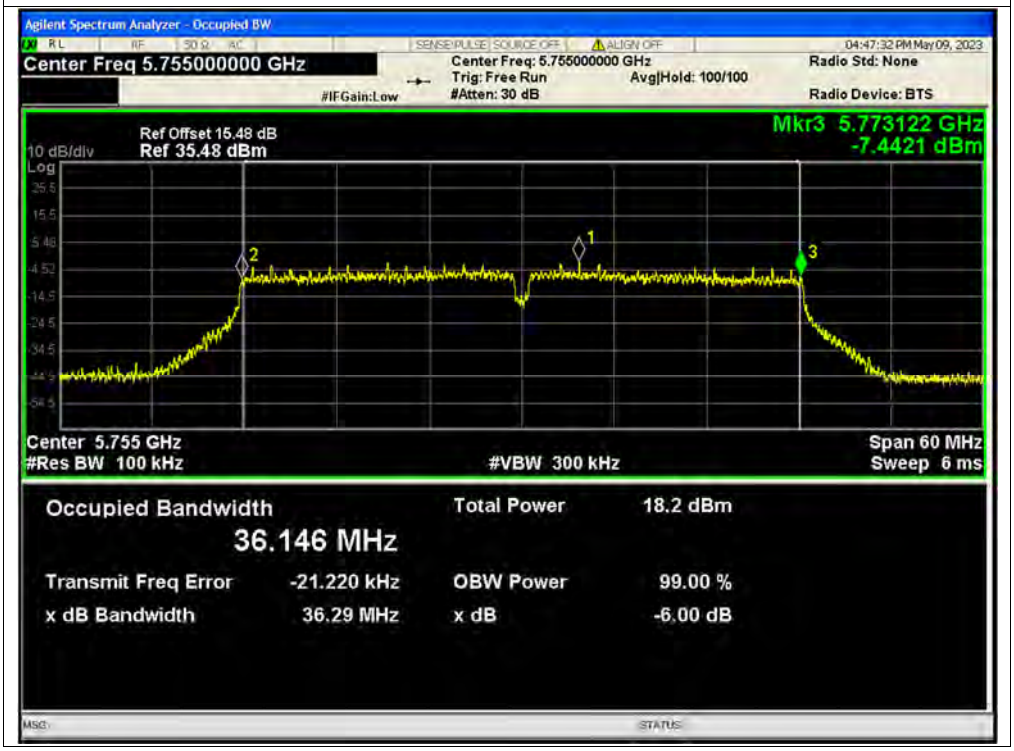
-6dB Bandwidth NVNT ac20 5785MHz Ant1

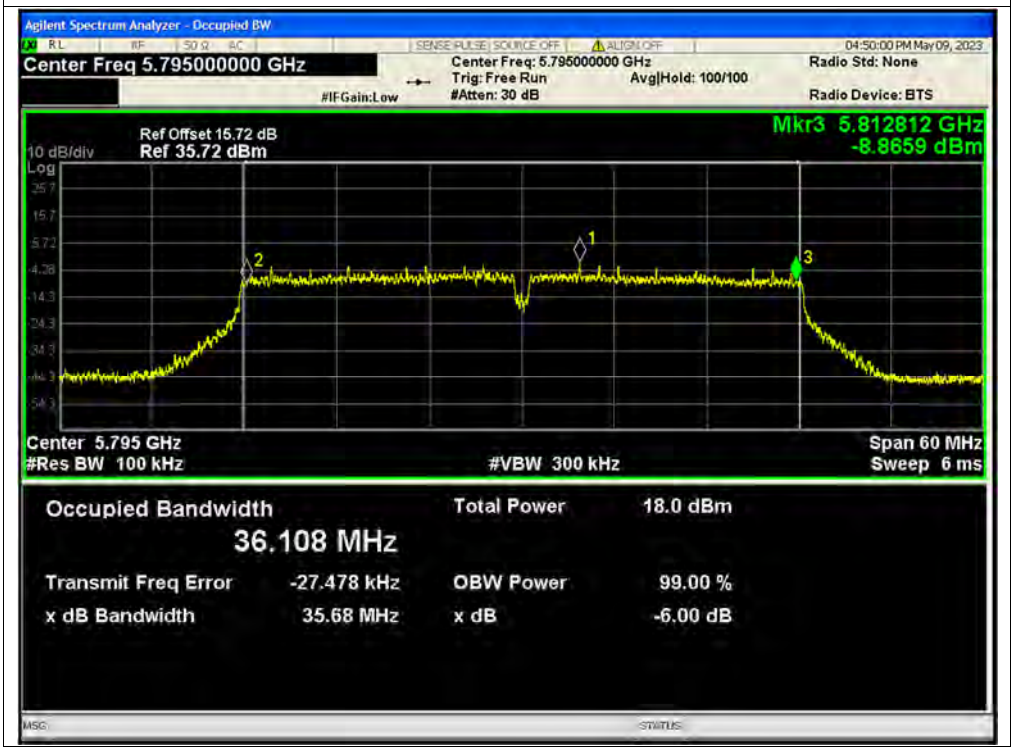


-6dB Bandwidth NVNT ac20 5825MHz Ant1



-6dB Bandwidth NVNT ac40 5755MHz Ant1



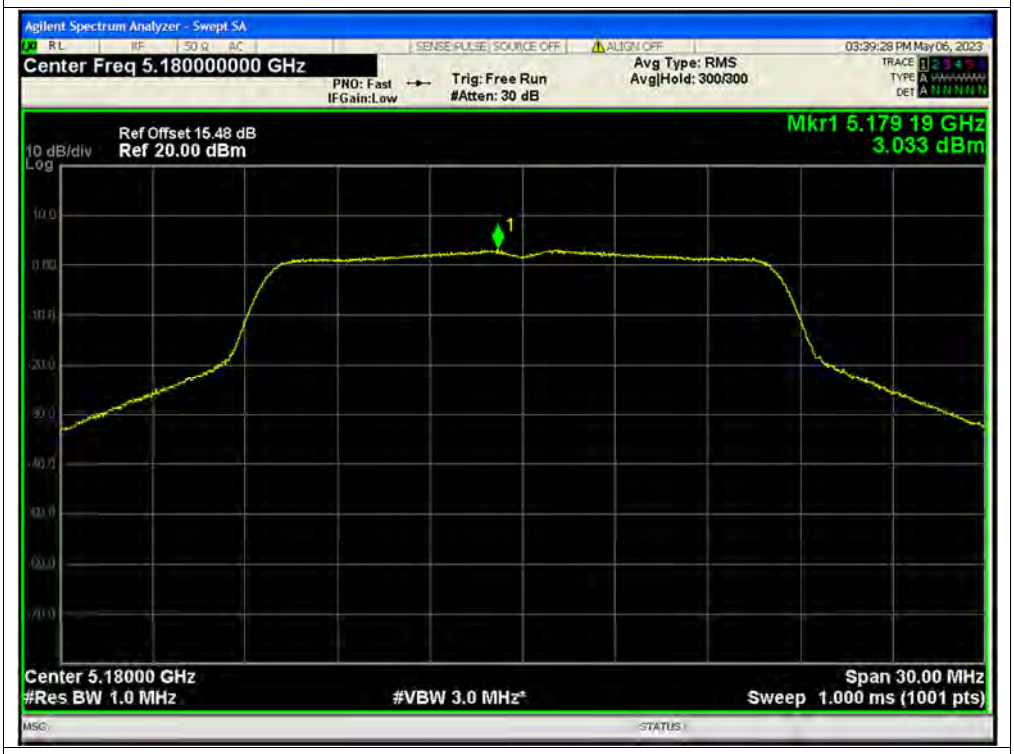
-6dB Bandwidth NVNT ac40 5795MHz Ant1


A.4. Peak Power Spectral Density

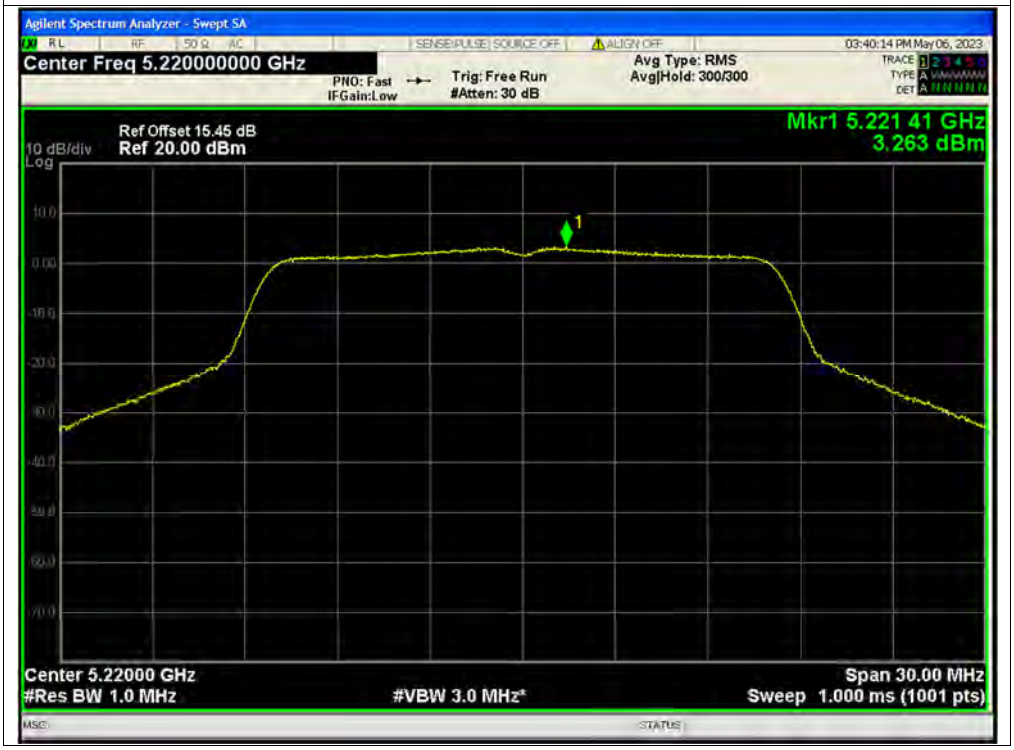
Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm)	Duty Factor (dB)	Total PSD (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	Ant1	3.03	0.08	3.11	11	Pass
NVNT	a	5220	Ant1	3.26	0.08	3.34	11	Pass
NVNT	a	5240	Ant1	2.99	0.08	3.07	11	Pass
NVNT	a	5260	Ant1	2.99	0.08	3.07	11	Pass
NVNT	a	5300	Ant1	2.96	0.08	3.04	11	Pass
NVNT	a	5320	Ant1	2.97	0.08	3.05	11	Pass
NVNT	a	5500	Ant1	3.16	0.08	3.24	11	Pass
NVNT	a	5580	Ant1	3	0.08	3.08	11	Pass
NVNT	a	5600	Ant1	2.88	0.08	2.96	11	Pass
NVNT	a	5700	Ant1	2.47	0.08	2.55	11	Pass
NVNT	a	5720	Ant1	3.15	0.08	3.23	11	Pass
NVNT	a	5745	Ant1	0.05	0.08	0.13	30	Pass
NVNT	a	5785	Ant1	0.29	0.08	0.37	30	Pass
NVNT	a	5825	Ant1	-0.03	0.08	0.05	30	Pass
NVNT	n20	5180	Ant1	1.41	0.08	1.49	11	Pass
NVNT	n20	5220	Ant1	1.51	0.08	1.59	11	Pass
NVNT	n20	5240	Ant1	1.37	0.08	1.45	11	Pass
NVNT	n20	5260	Ant1	1.89	0.08	1.97	11	Pass
NVNT	n20	5300	Ant1	2.51	0.08	2.59	11	Pass
NVNT	n20	5320	Ant1	2.5	0.08	2.58	11	Pass
NVNT	n20	5500	Ant1	2.47	0.08	2.55	11	Pass
NVNT	n20	5580	Ant1	2.02	0.08	2.1	11	Pass
NVNT	n20	5600	Ant1	1.93	0.08	2.01	11	Pass
NVNT	n20	5720	Ant1	2.17	0.08	2.25	11	Pass
NVNT	n20	5745	Ant1	-0.84	0.08	-0.76	30	Pass
NVNT	n20	5785	Ant1	-0.9	0.08	-0.82	30	Pass
NVNT	n20	5825	Ant1	-1.1	0.08	-1.02	30	Pass
NVNT	n40	5190	Ant1	-0.83	0.17	-0.66	11	Pass
NVNT	n40	5230	Ant1	-0.92	0.17	-0.75	11	Pass
NVNT	n40	5270	Ant1	-0.9	0.17	-0.73	11	Pass
NVNT	n40	5310	Ant1	-0.96	0.17	-0.79	11	Pass
NVNT	n40	5510	Ant1	-1.39	0.17	-1.22	11	Pass
NVNT	n40	5550	Ant1	-1.31	0.17	-1.14	11	Pass
NVNT	n40	5630	Ant1	-1.92	0.17	-1.75	11	Pass

NVNT	n40	5710	Ant1	-1.83	0.17	-1.66	11	Pass
NVNT	n40	5755	Ant1	-4.68	0.17	-4.51	30	Pass
NVNT	n40	5795	Ant1	-4.6	0.17	-4.43	30	Pass
NVNT	ac20	5180	Ant1	2	0.08	2.08	11	Pass
NVNT	ac20	5220	Ant1	2.11	0.08	2.19	11	Pass
NVNT	ac20	5240	Ant1	1.96	0.08	2.04	11	Pass
NVNT	ac20	5260	Ant1	1.91	0.08	1.99	11	Pass
NVNT	ac20	5300	Ant1	2.52	0.08	2.6	11	Pass
NVNT	ac20	5320	Ant1	2.44	0.08	2.52	11	Pass
NVNT	ac20	5500	Ant1	1.99	0.08	2.07	11	Pass
NVNT	ac20	5580	Ant1	1.78	0.08	1.86	11	Pass
NVNT	ac20	5600	Ant1	1.72	0.08	1.8	11	Pass
NVNT	ac20	5720	Ant1	2.23	0.08	2.31	11	Pass
NVNT	ac20	5745	Ant1	-0.8	0.08	-0.72	30	Pass
NVNT	ac20	5785	Ant1	-0.64	0.08	-0.56	30	Pass
NVNT	ac20	5825	Ant1	-1.02	0.08	-0.94	30	Pass
NVNT	ac40	5190	Ant1	-0.72	0.16	-0.56	11	Pass
NVNT	ac40	5230	Ant1	-0.54	0.16	-0.38	11	Pass
NVNT	ac40	5270	Ant1	-0.3	0.16	-0.14	11	Pass
NVNT	ac40	5310	Ant1	-0.25	0.16	-0.09	11	Pass
NVNT	ac40	5510	Ant1	-1.95	0.16	-1.79	11	Pass
NVNT	ac40	5550	Ant1	-1.81	0.16	-1.65	11	Pass
NVNT	ac40	5630	Ant1	-2.38	0.16	-2.22	11	Pass
NVNT	ac40	5710	Ant1	-2.02	0.16	-1.86	11	Pass
NVNT	ac40	5755	Ant1	-4.58	0.16	-4.42	30	Pass
NVNT	ac40	5795	Ant1	-4.67	0.16	-4.51	30	Pass

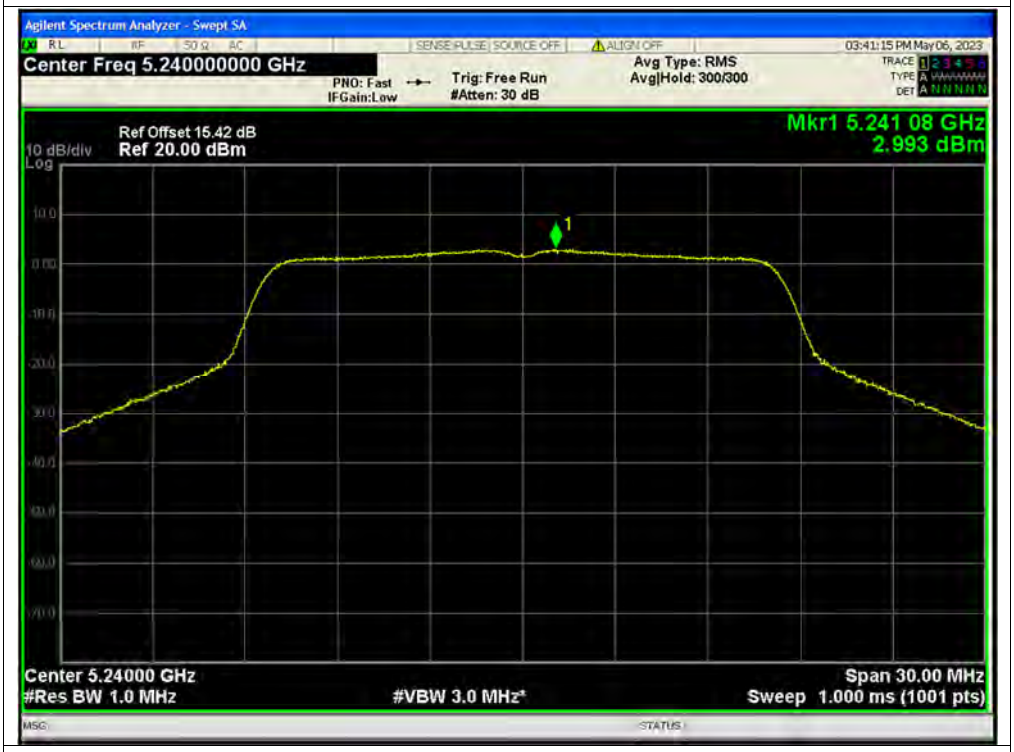
Test Graphs
PSD NVNT a 5180MHz Ant1



PSD NVNT a 5220MHz Ant1

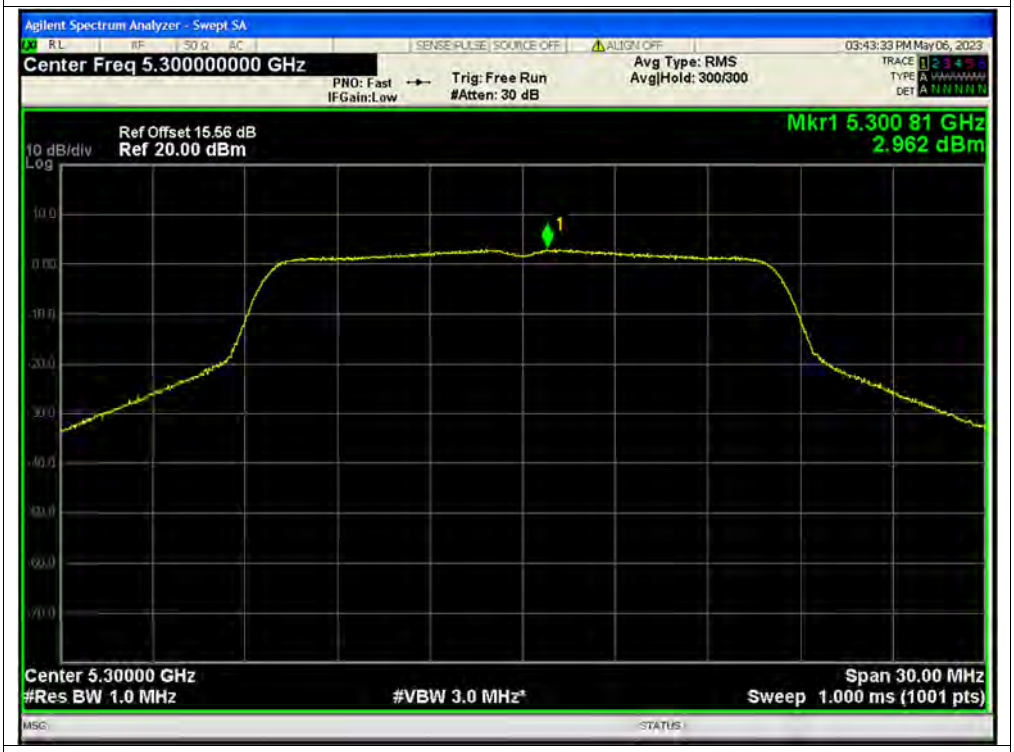


PSD NVNT a 5240MHz Ant1

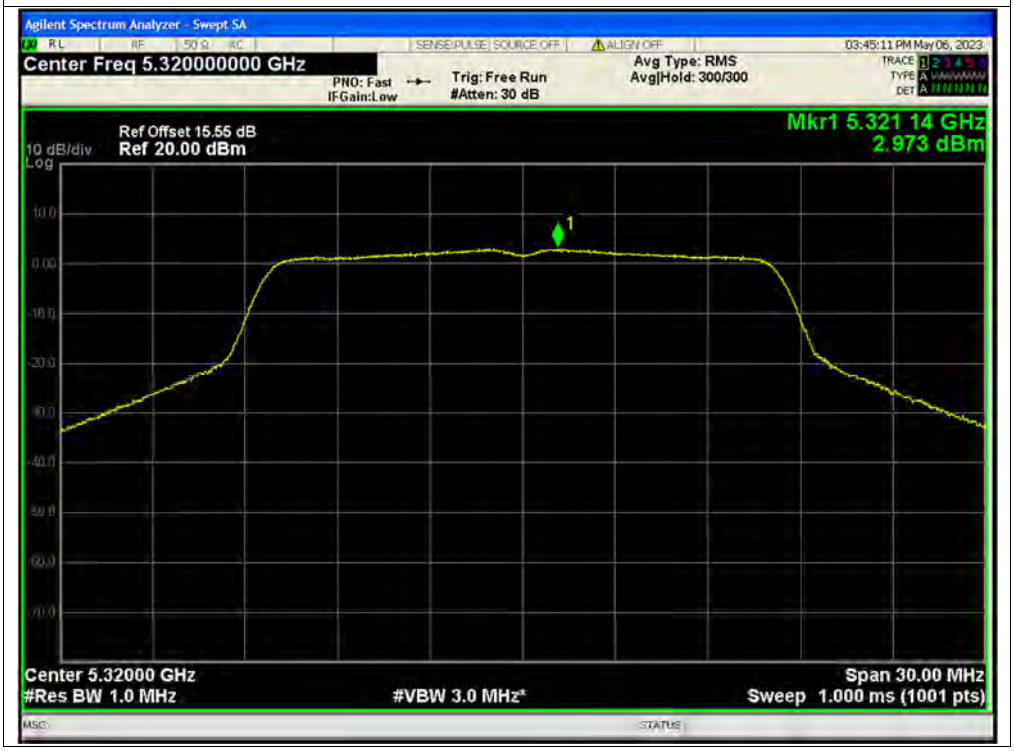


PSD NVNT a 5260MHz Ant1

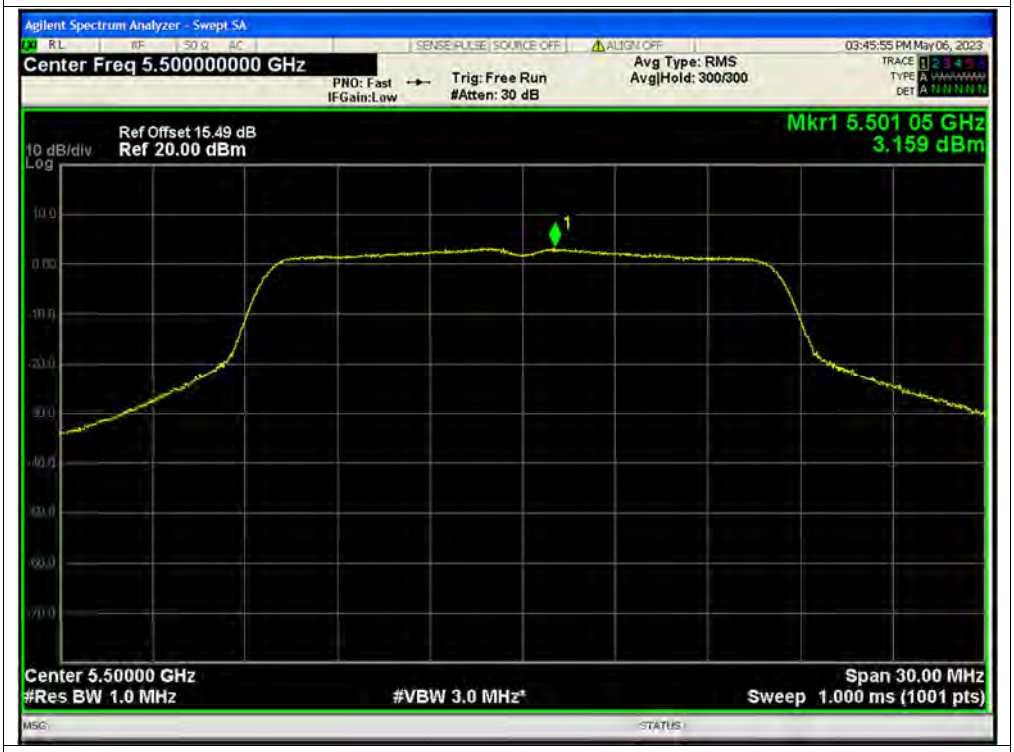
PSD NVNT a 5300MHz Ant1



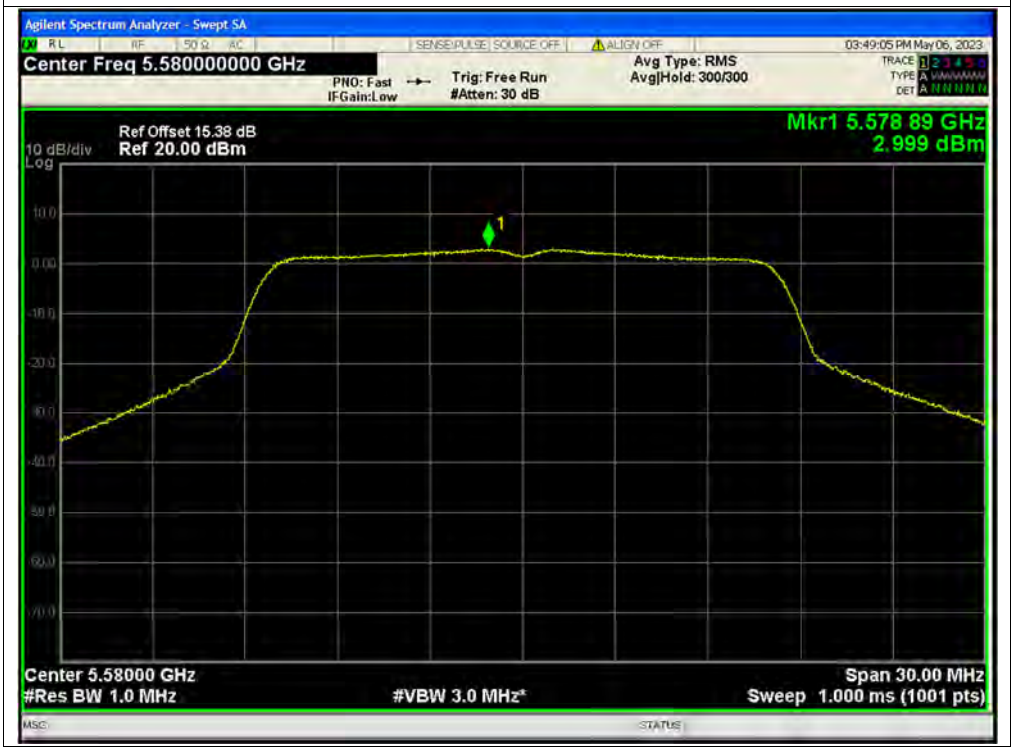
PSD NVNT a 5320MHz Ant1



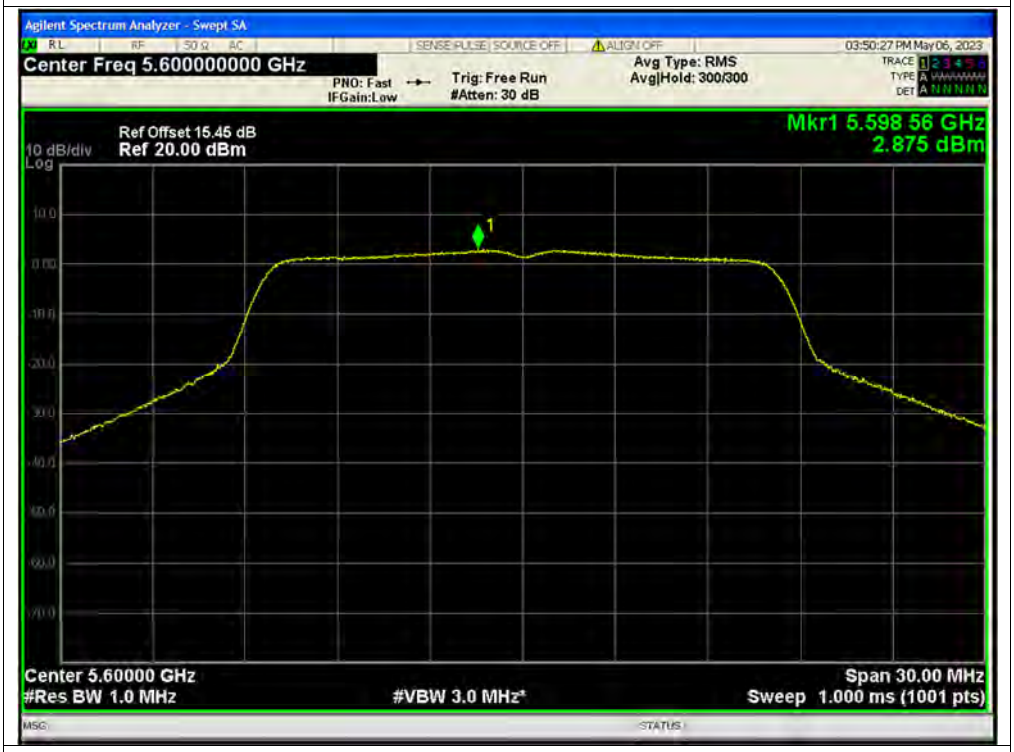
PSD NVNT a 5500MHz Ant1



PSD NVNT a 5580MHz Ant1

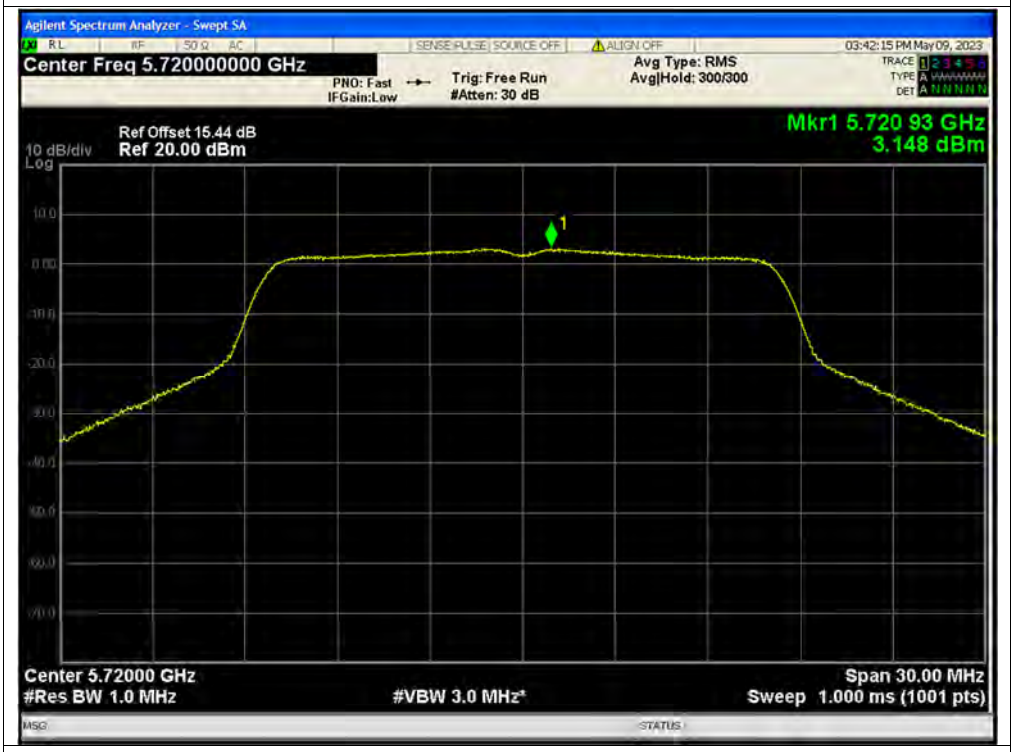


PSD NVNT a 5600MHz Ant1

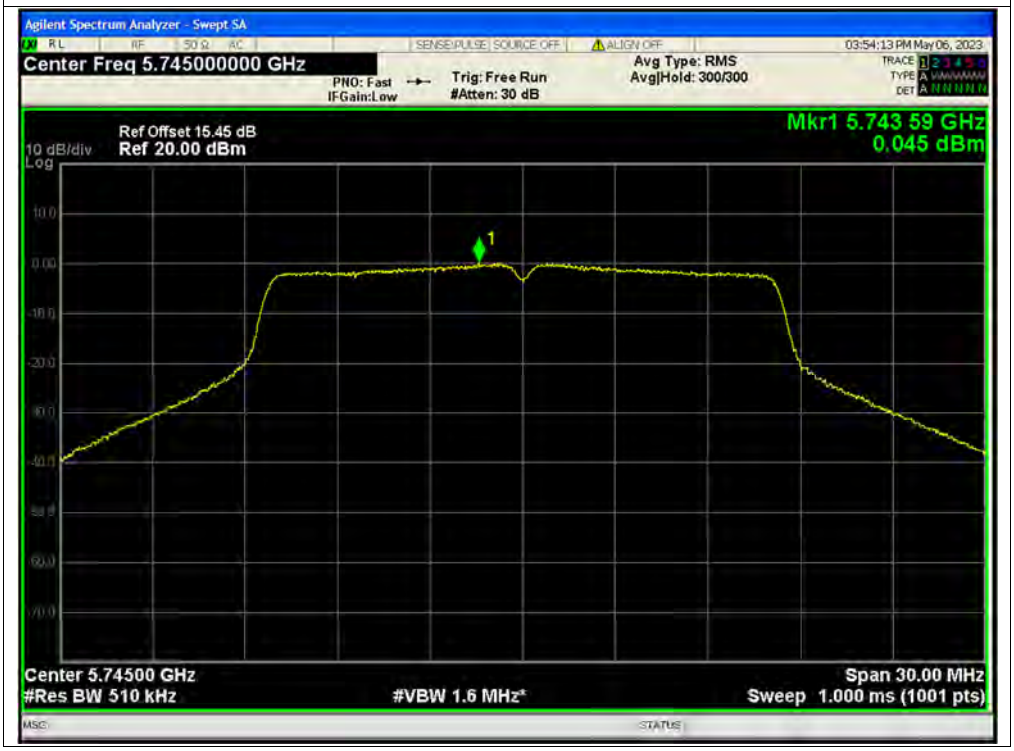


PSD NVNT a 5700MHz Ant1

PSD NVNT a 5720MHz Ant1



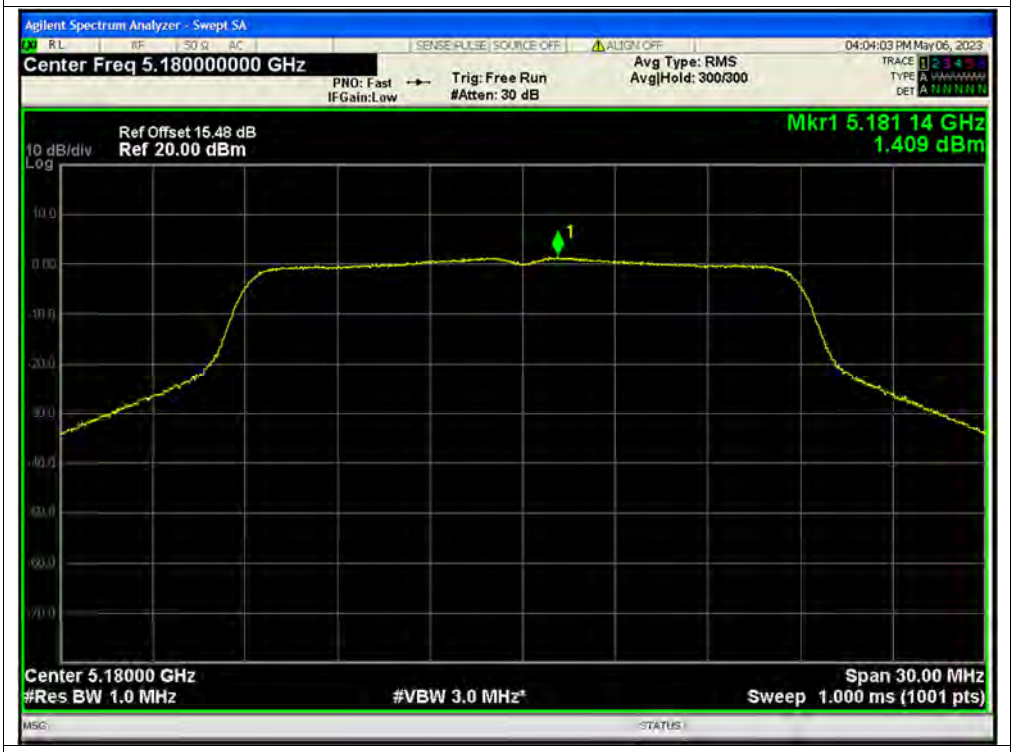
PSD NVNT a 5745MHz Ant1



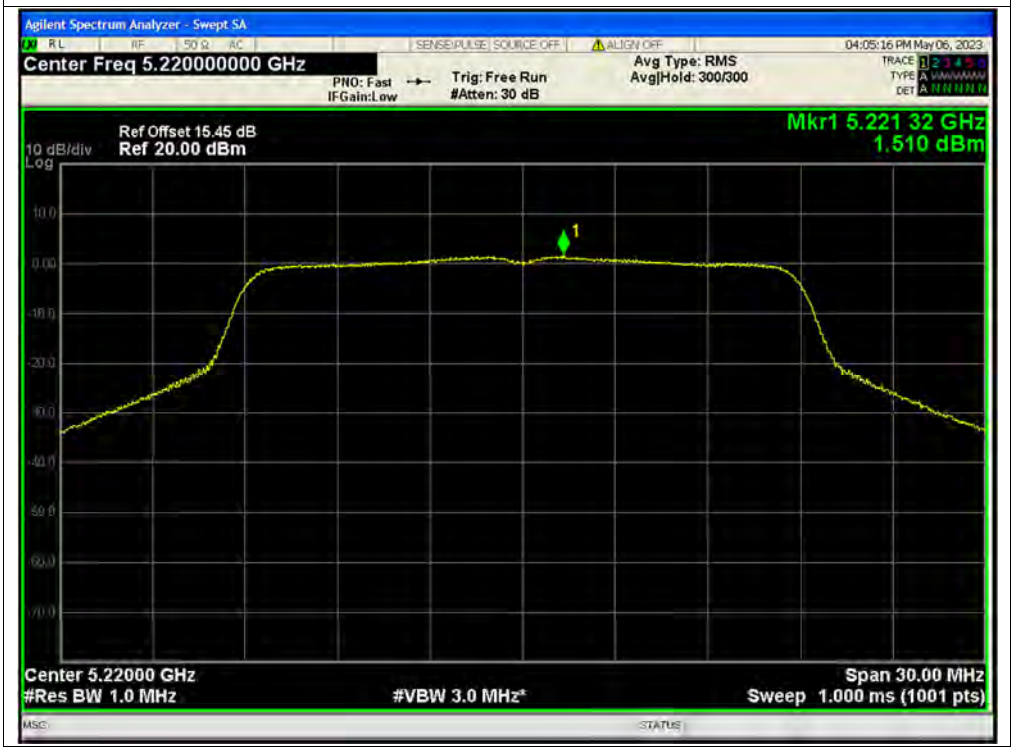
PSD NVNT a 5785MHz Ant1

PSD NVNT a 5825MHz Ant1

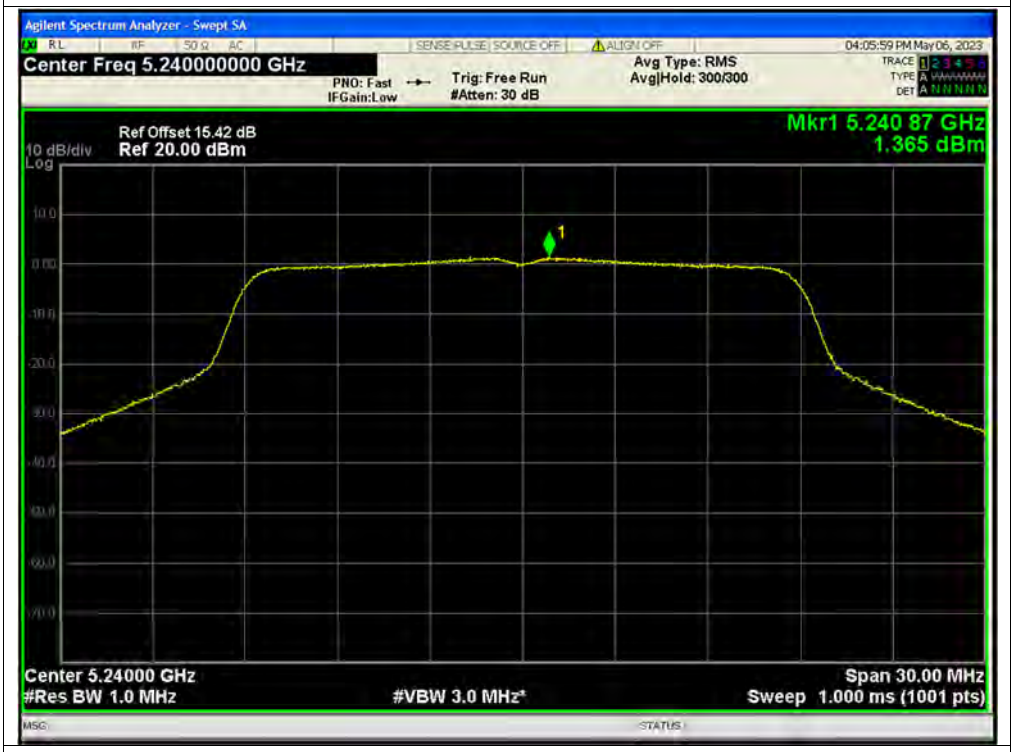
PSD NVNT n20 5180MHz Ant1



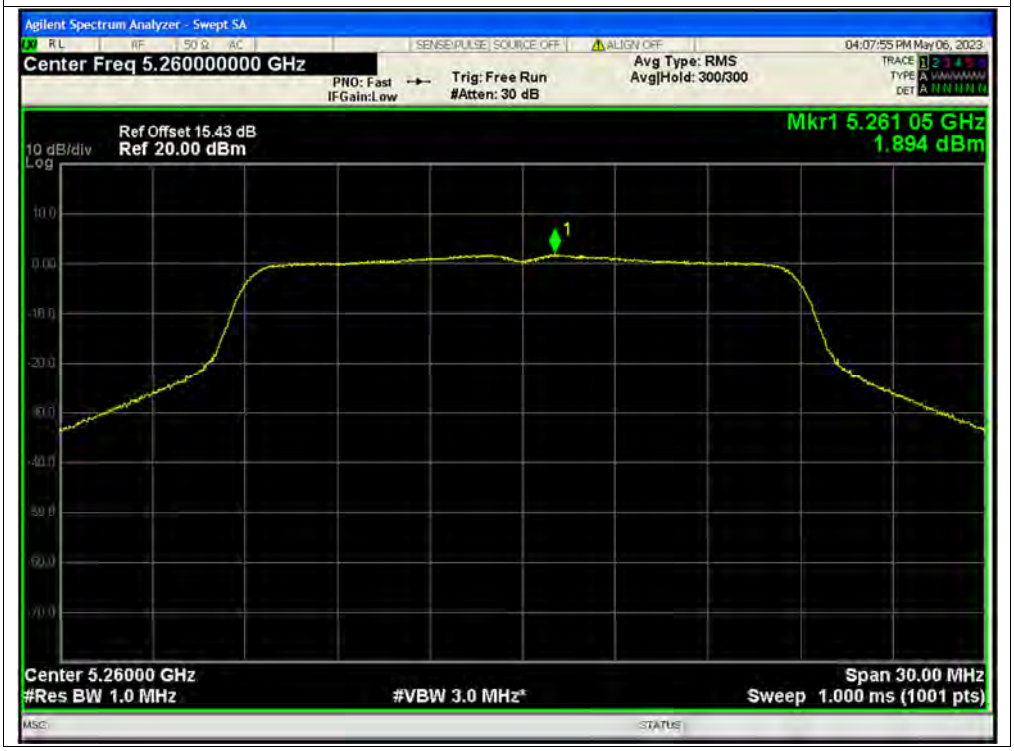
PSD NVNT n20 5220MHz Ant1



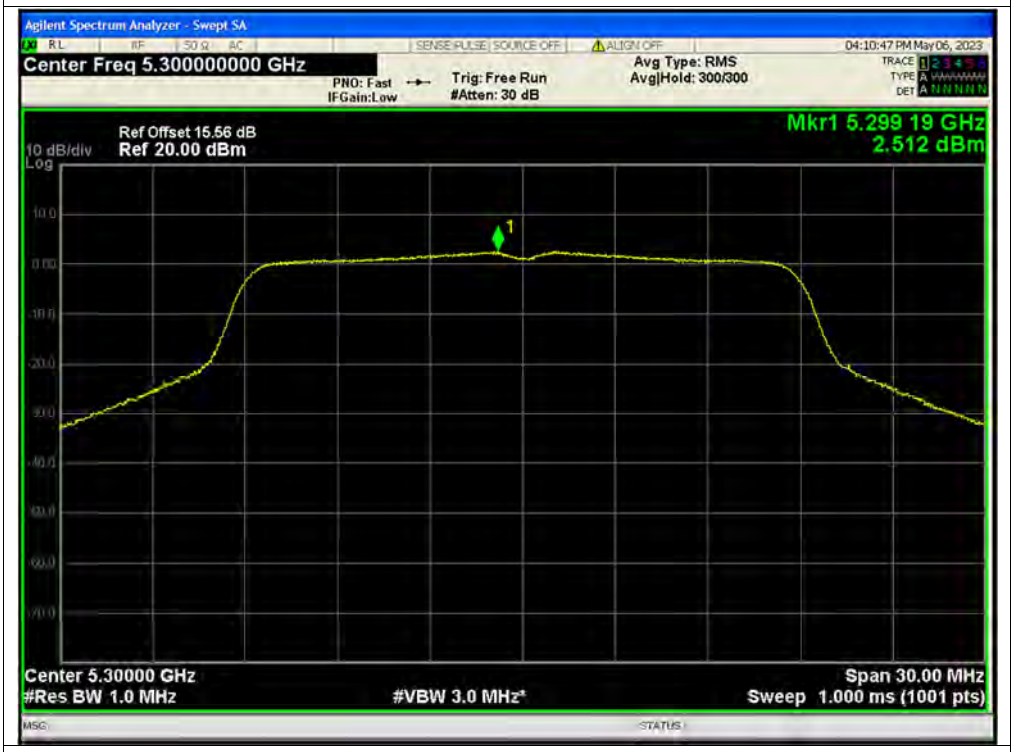
PSD NVNT n20 5240MHz Ant1



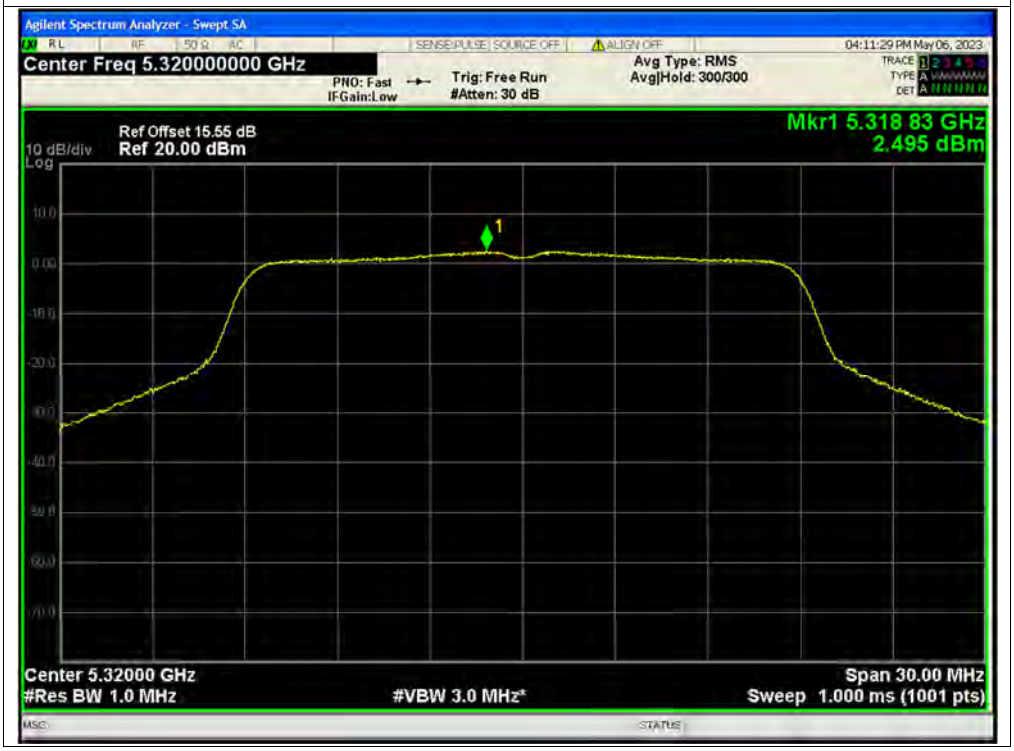
PSD NVNT n20 5260MHz Ant1



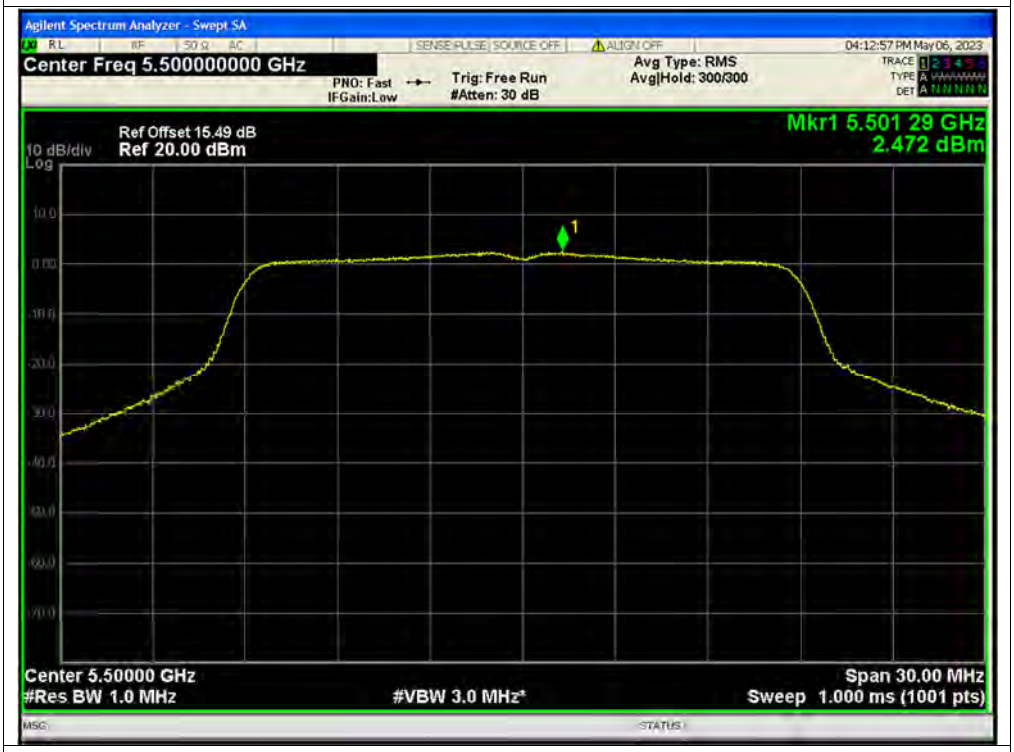
PSD NVNT n20 5300MHz Ant1



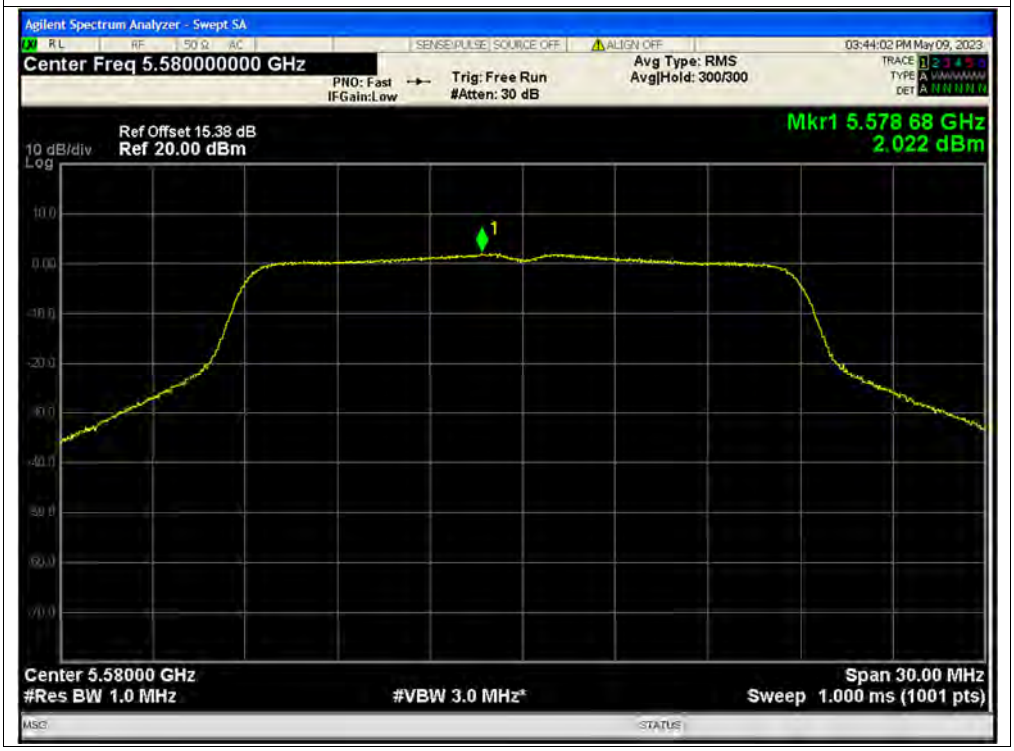
PSD NVNT n20 5320MHz Ant1



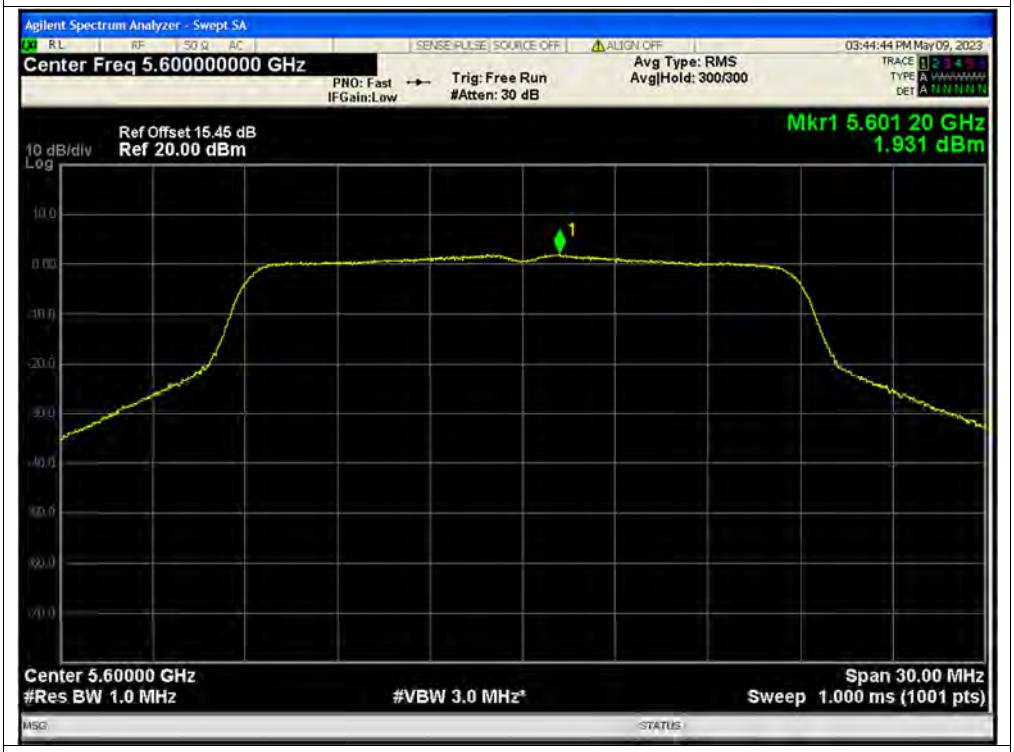
PSD NVNT n20 5500MHz Ant1



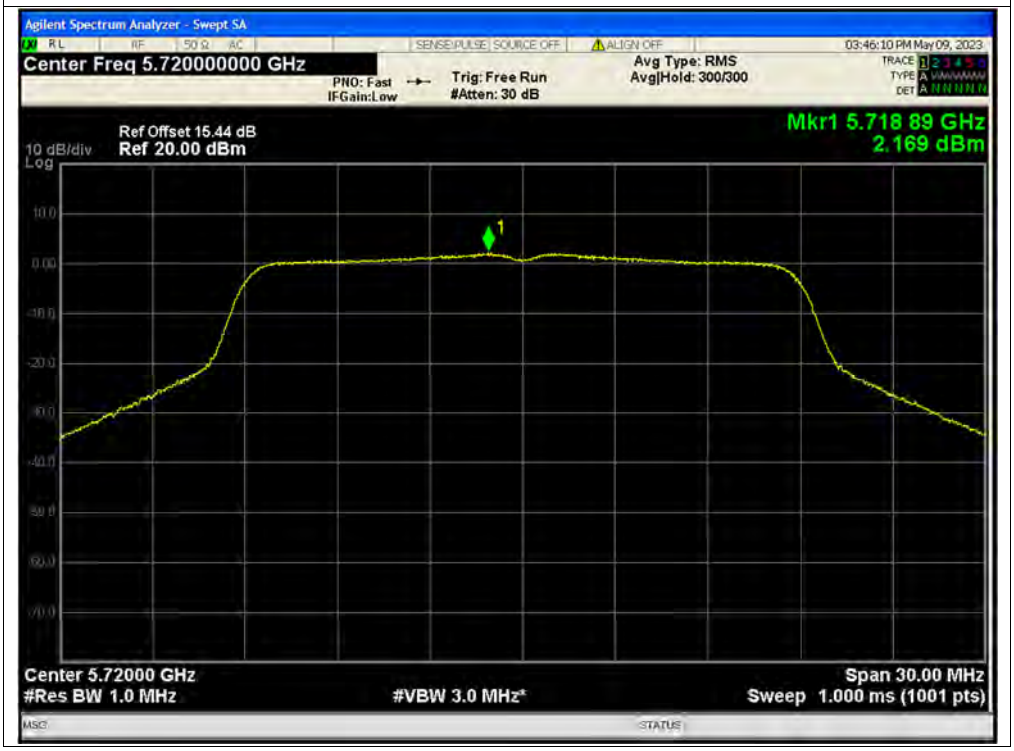
PSD NVNT n20 5580MHz Ant1



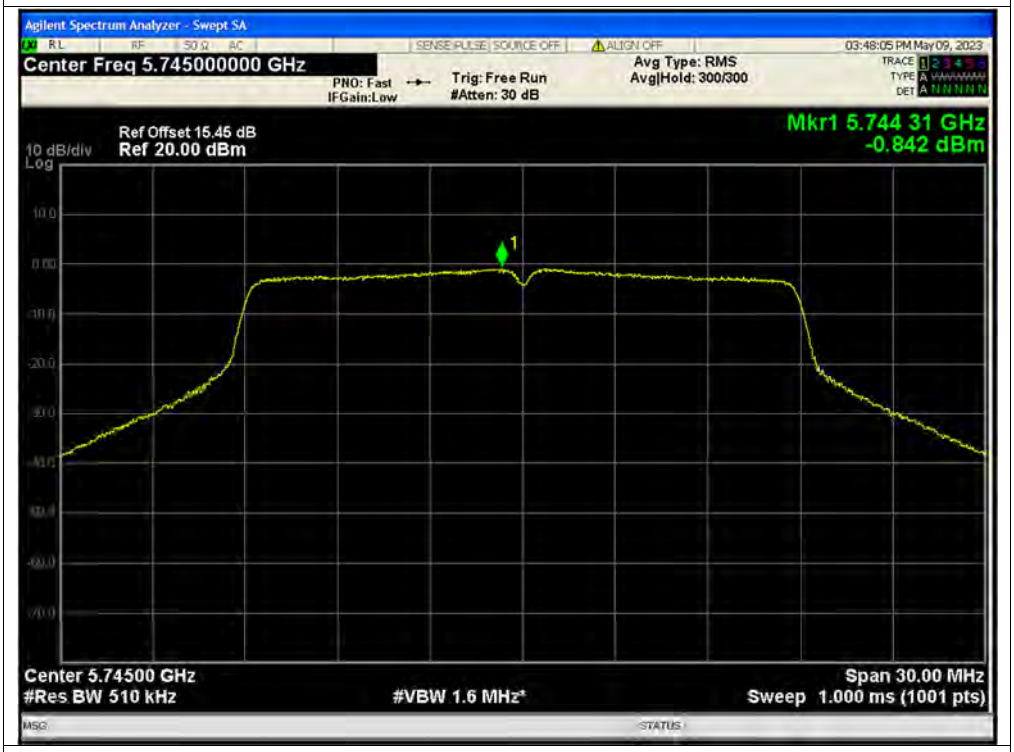
PSD NVNT n20 5600MHz Ant1



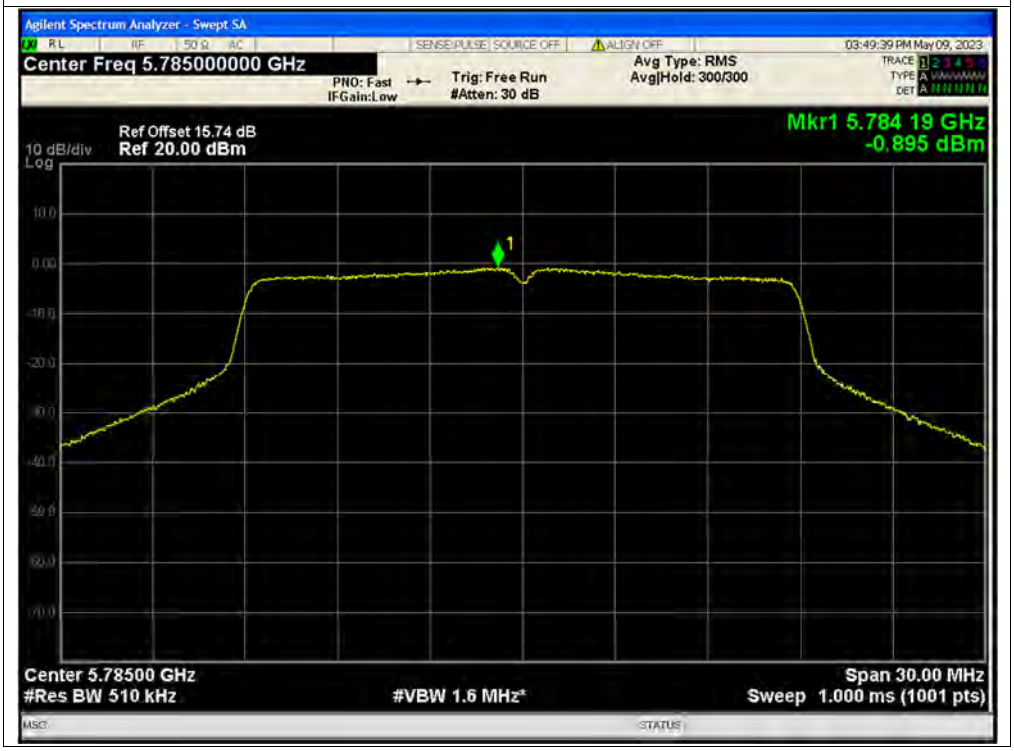
PSD NVNT n20 5720MHz Ant1



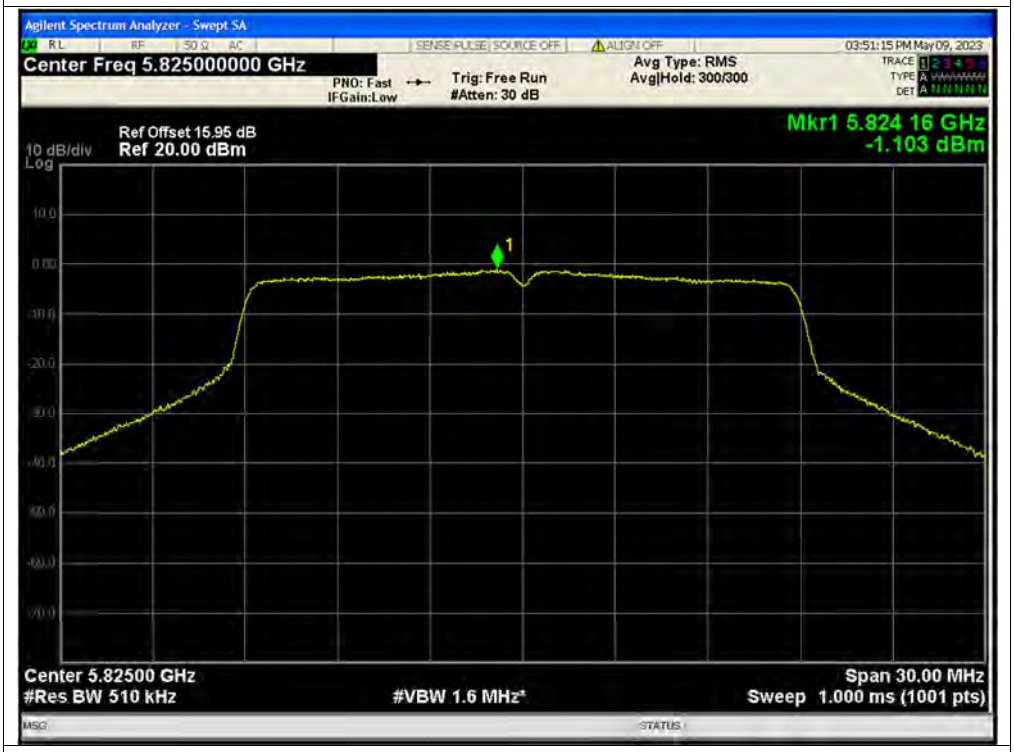
PSD NVNT n20 5745MHz Ant1



PSD NVNT n20 5785MHz Ant1

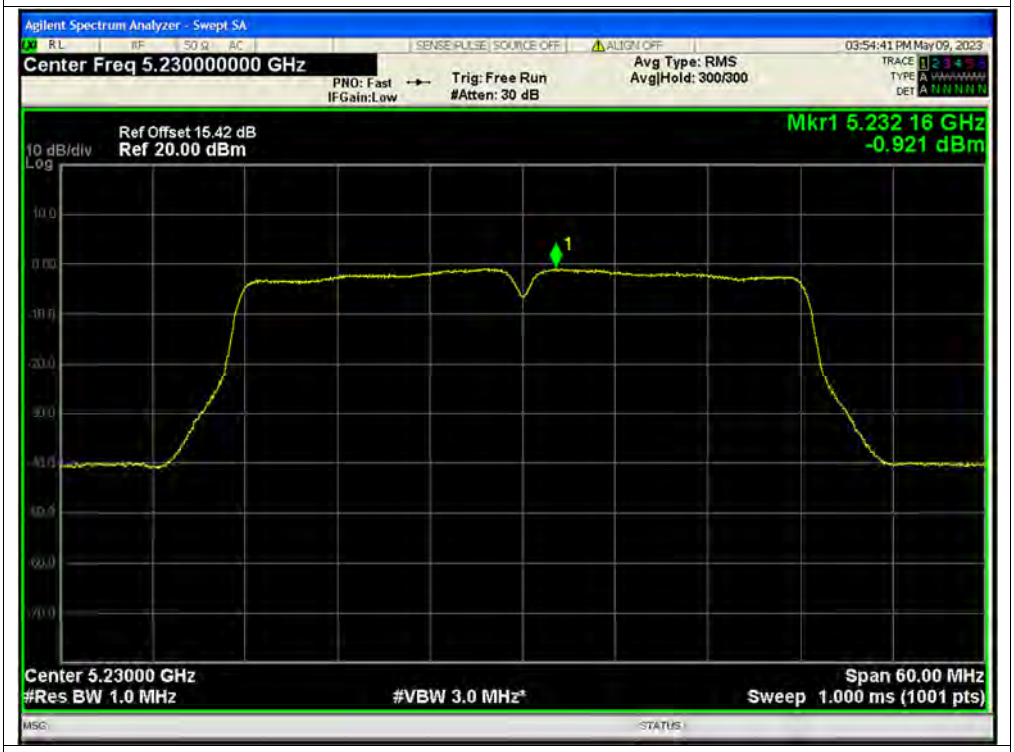


PSD NVNT n20 5825MHz Ant1



PSD NVNT n40 5190MHz Ant1

PSD NVNT n40 5230MHz Ant1



PSD NVNT n40 5270MHz Ant1

PSD NVNT n40 5310MHz Ant1

PSD NVNT n40 5510MHz Ant1

PSD NVNT n40 5550MHz Ant1

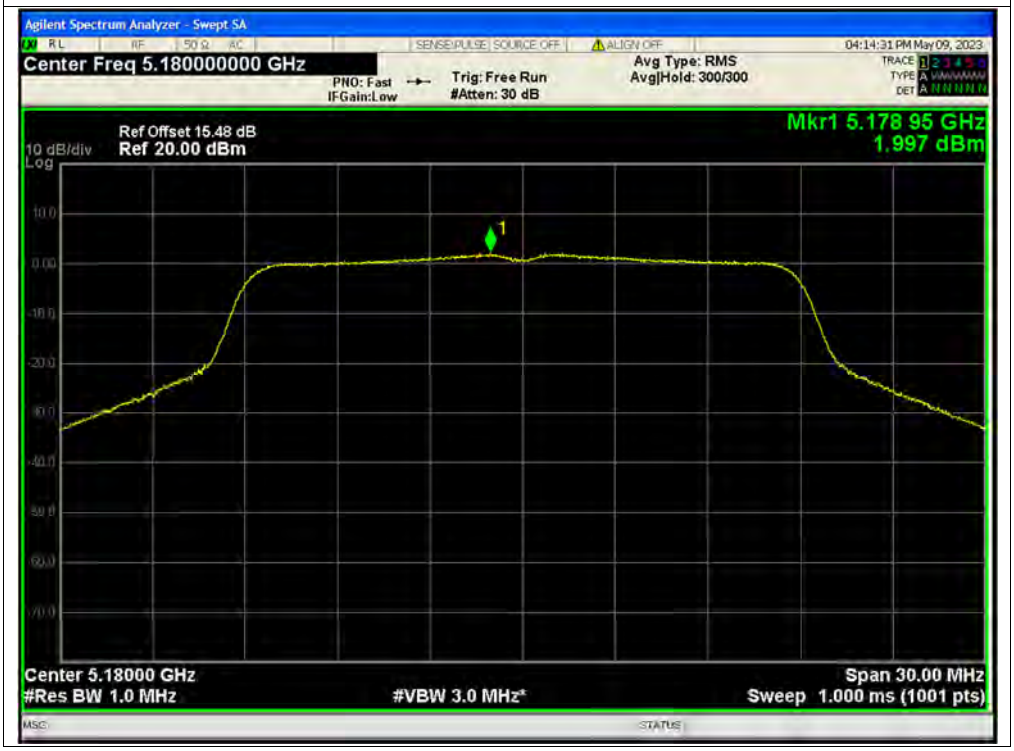
PSD NVNT n40 5630MHz Ant1

PSD NVNT n40 5710MHz Ant1

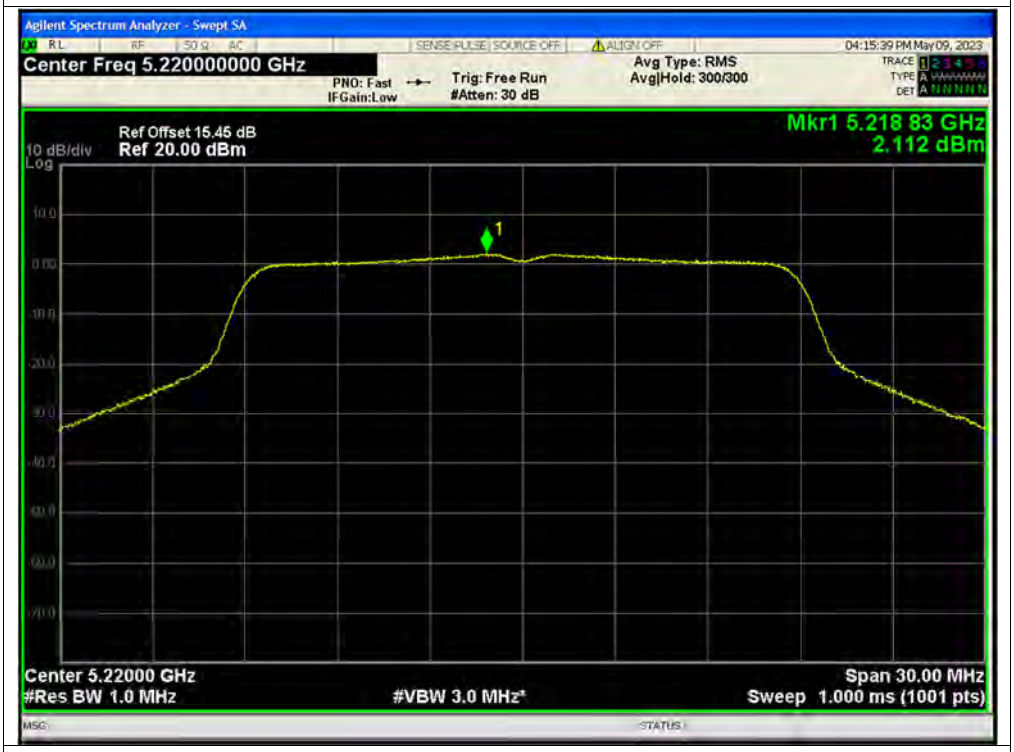
PSD NVNT n40 5755MHz Ant1

PSD NVNT n40 5795MHz Ant1

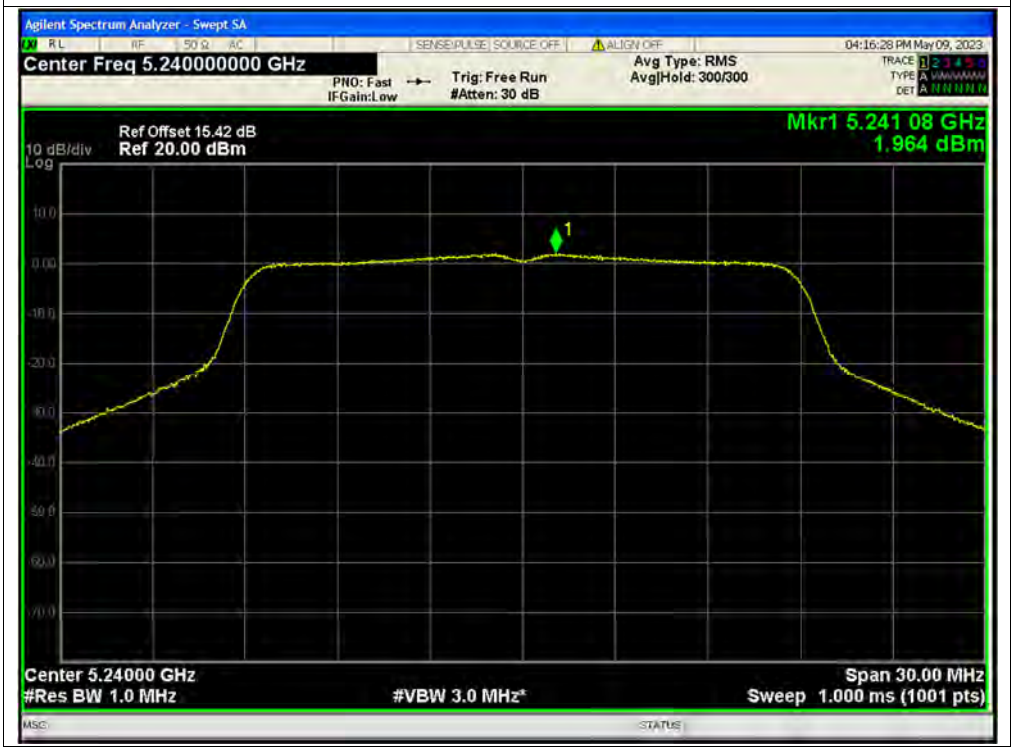
PSD NVNT ac20 5180MHz Ant1



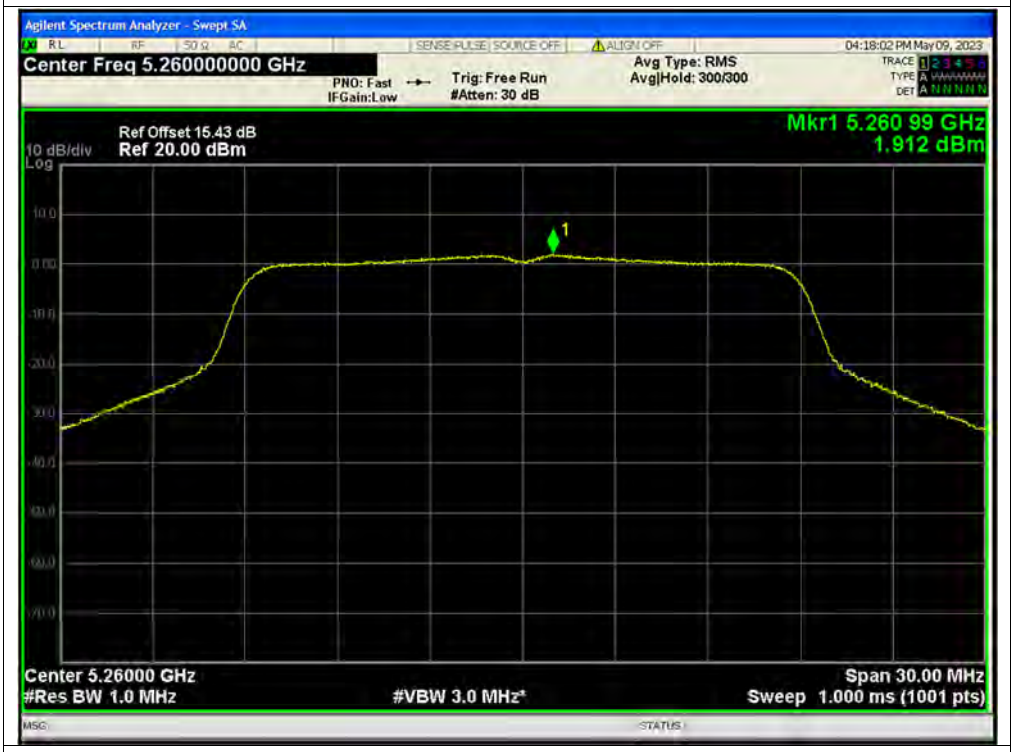
PSD NVNT ac20 5220MHz Ant1



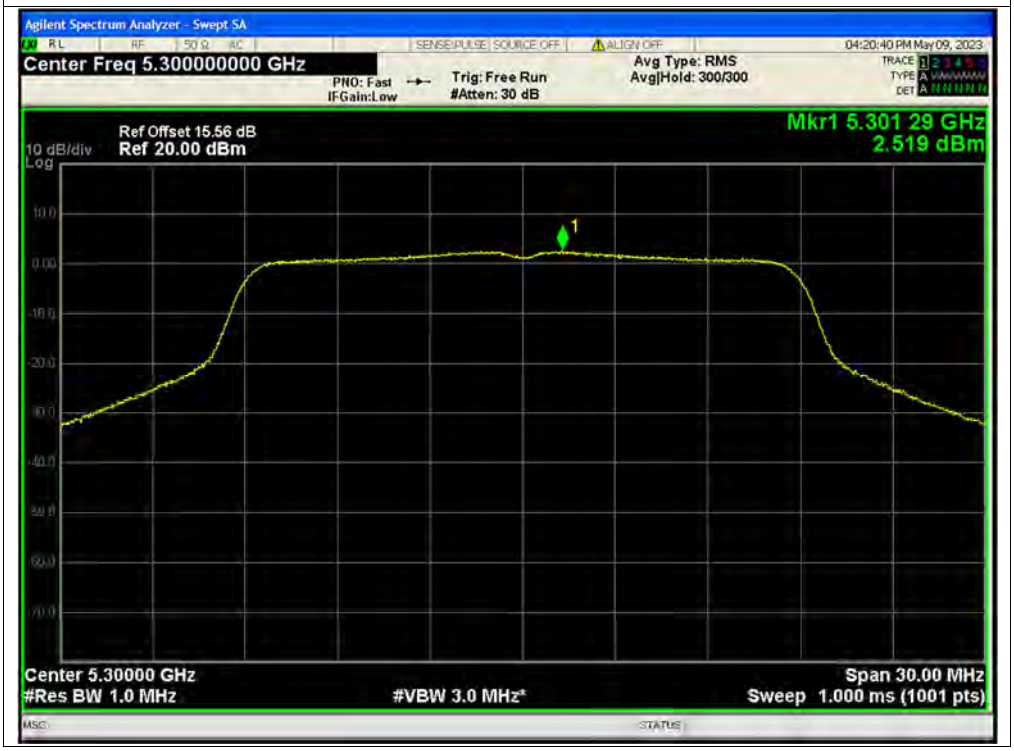
PSD NVNT ac20 5240MHz Ant1



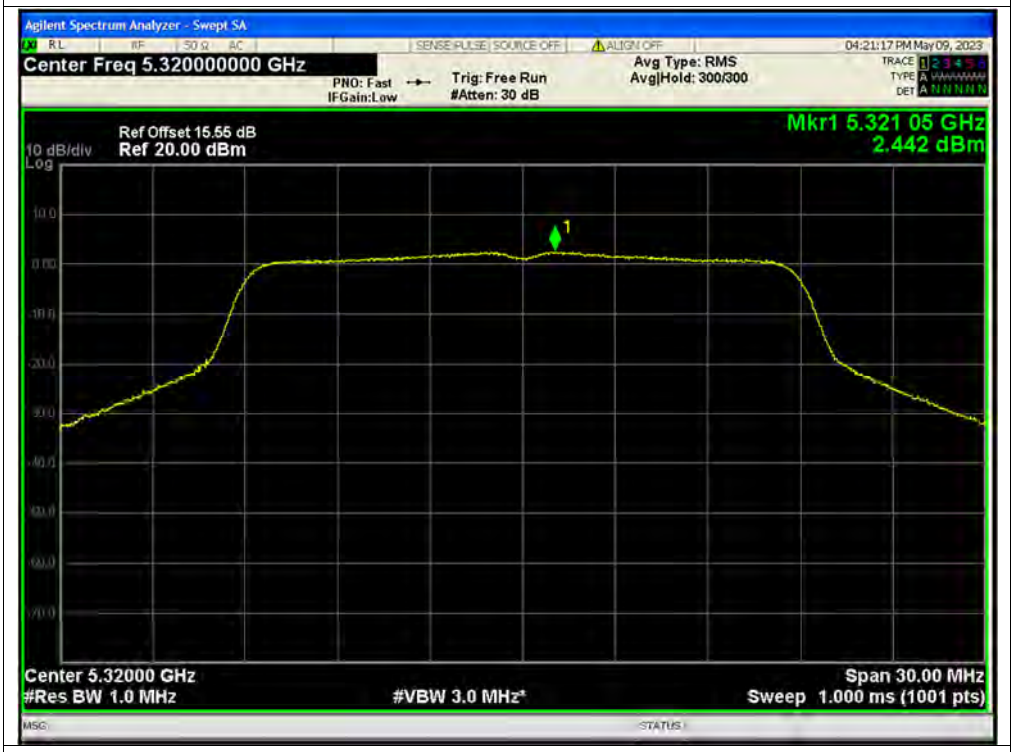
PSD NVNT ac20 5260MHz Ant1



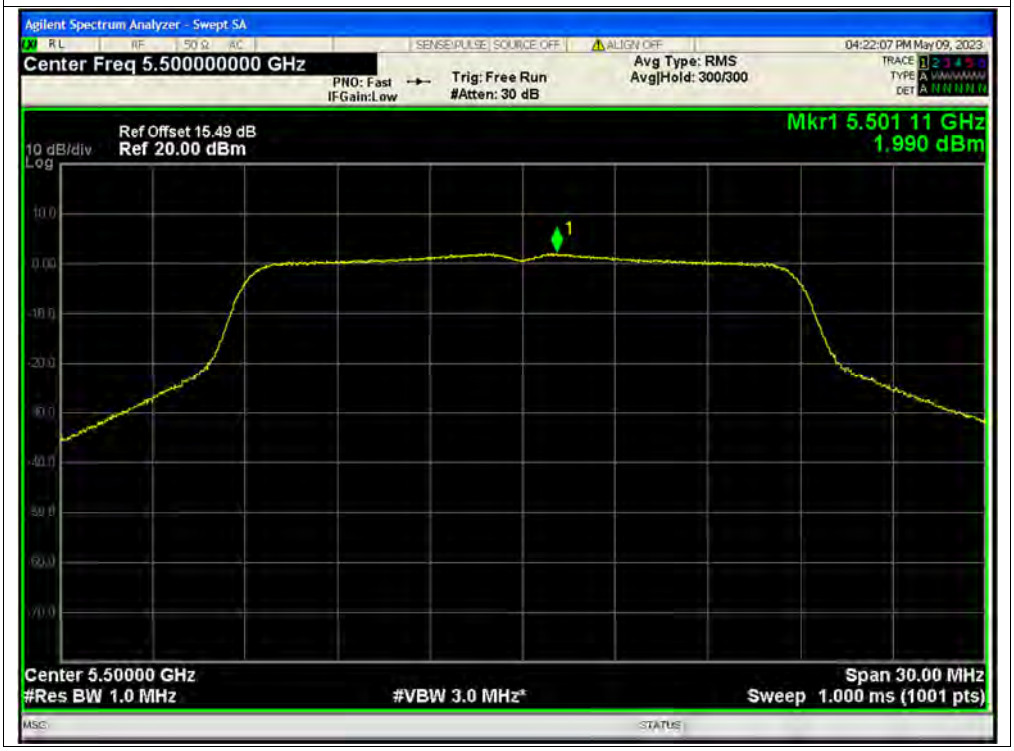
PSD NVNT ac20 5300MHz Ant1



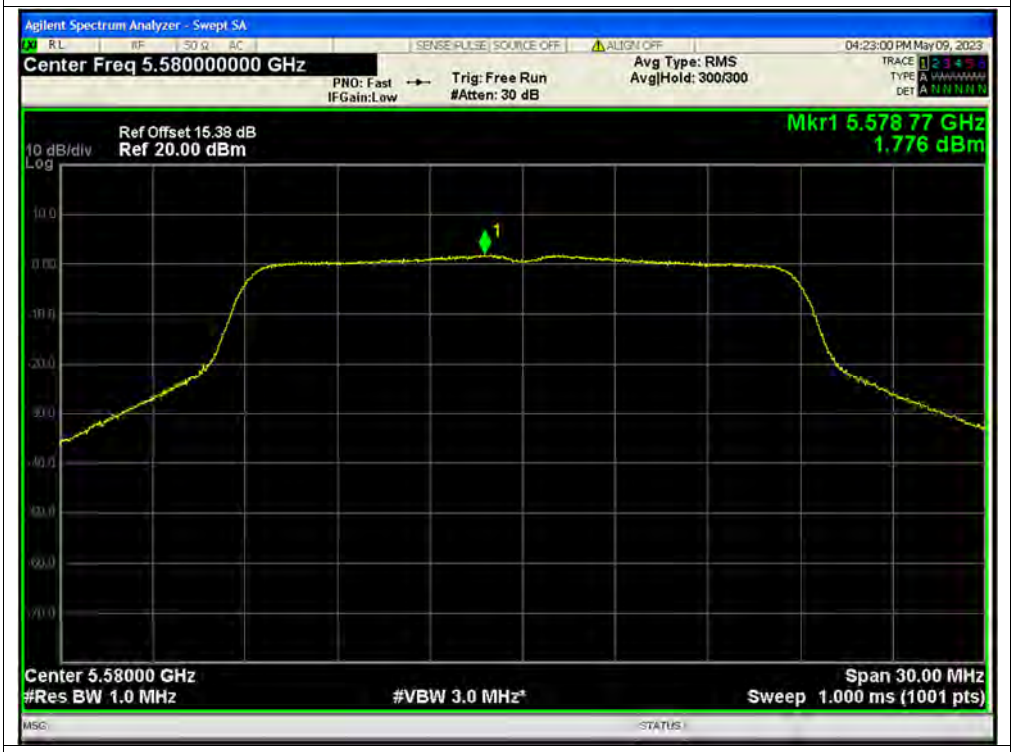
PSD NVNT ac20 5320MHz Ant1



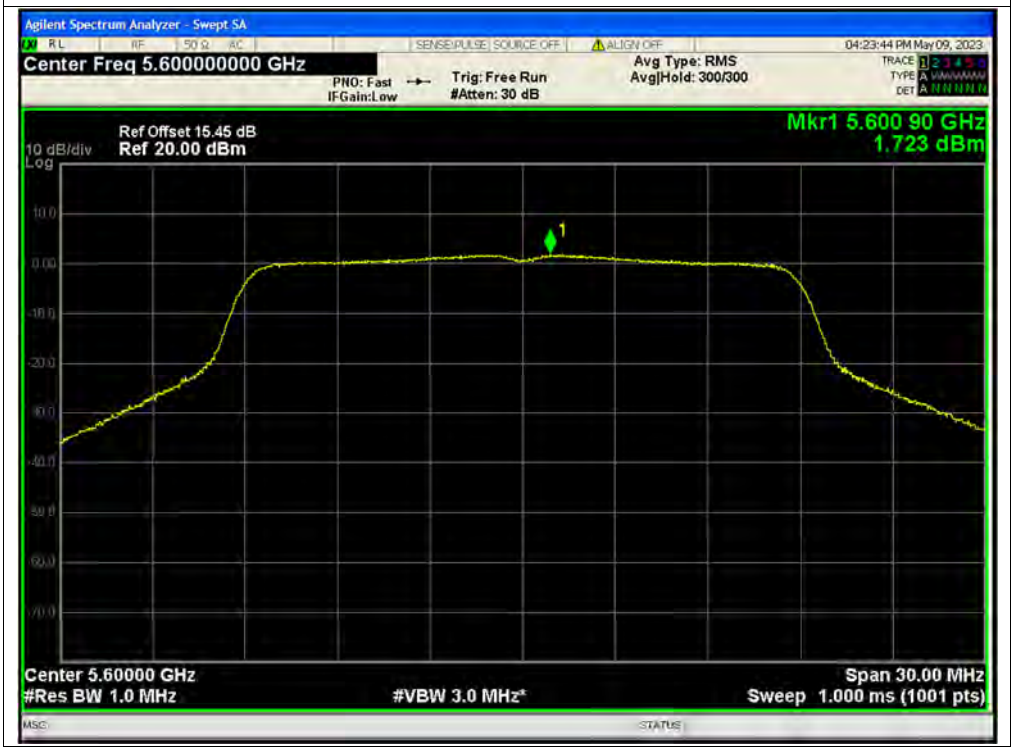
PSD NVNT ac20 5500MHz Ant1



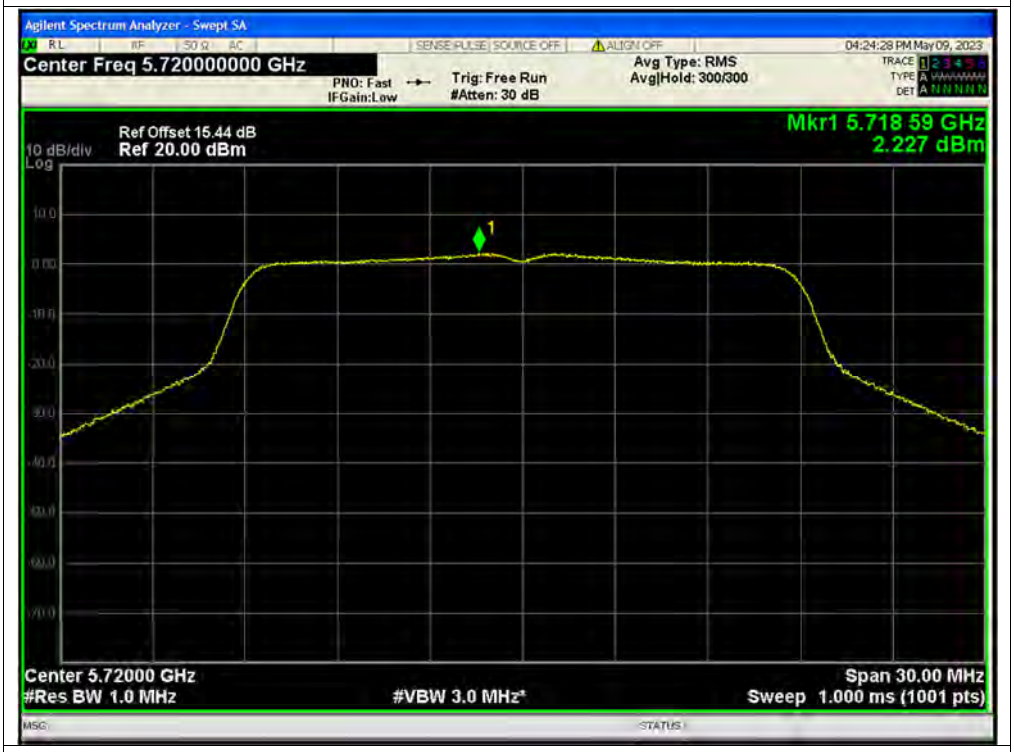
PSD NVNT ac20 5580MHz Ant1



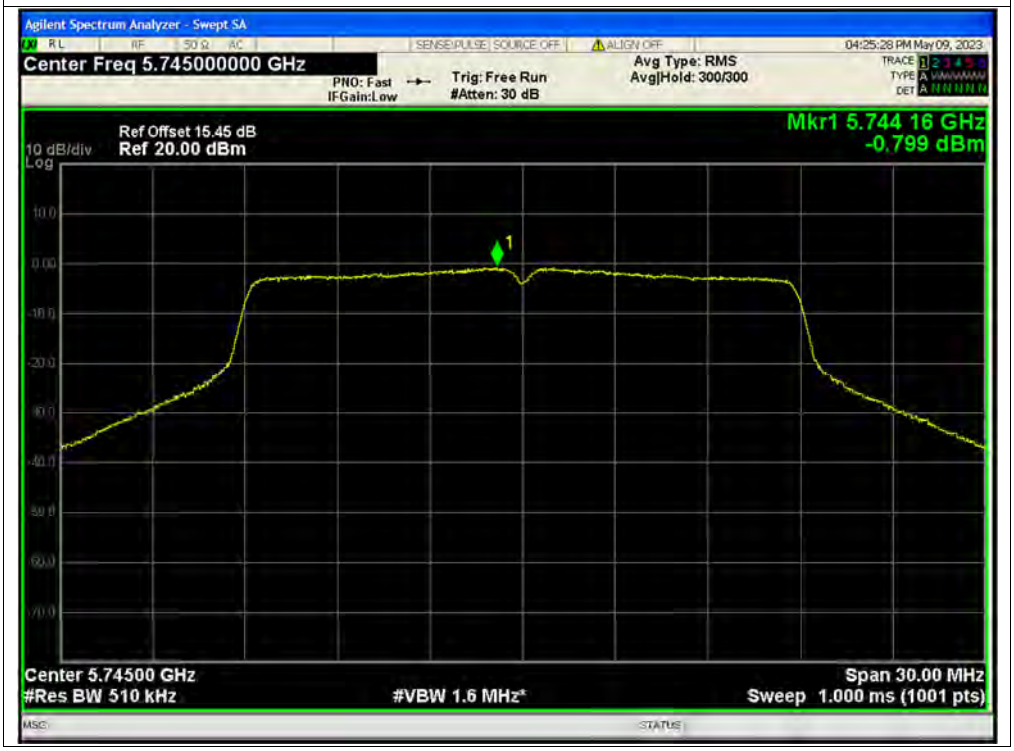
PSD NVNT ac20 5600MHz Ant1



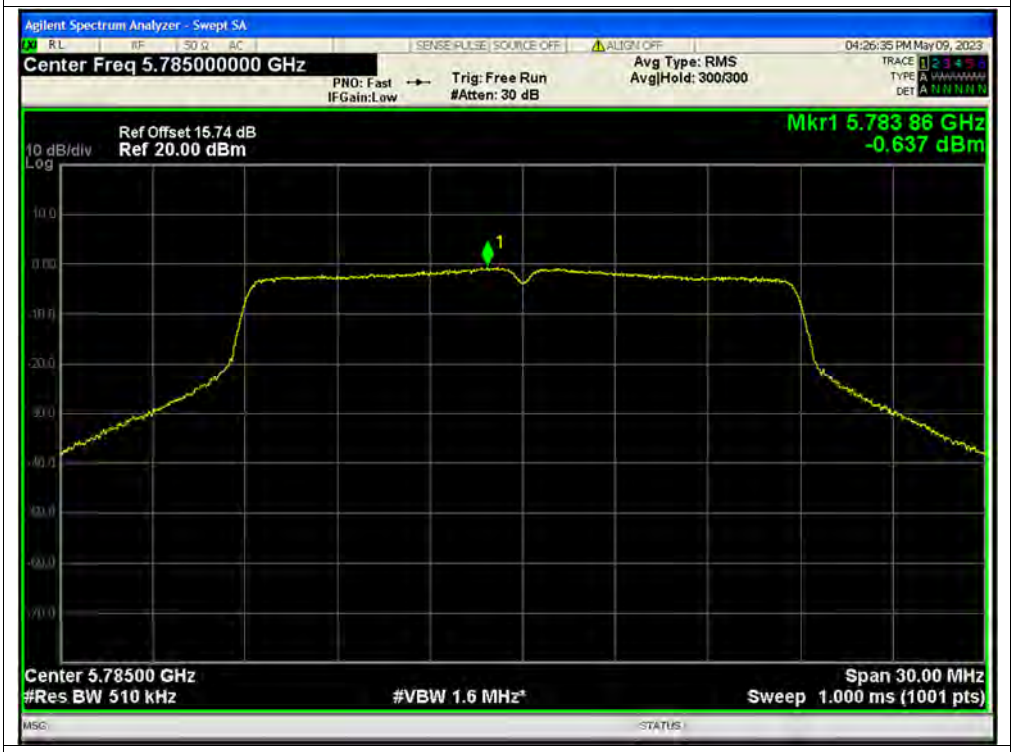
PSD NVNT ac20 5720MHz Ant1



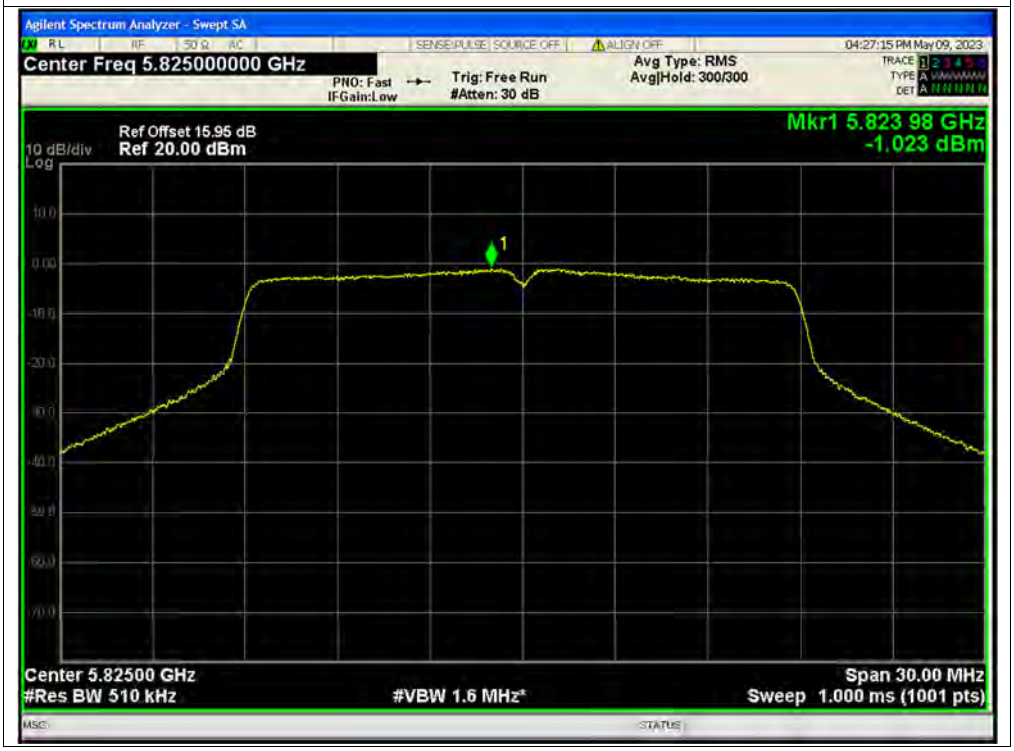
PSD NVNT ac20 5745MHz Ant1



PSD NVNT ac20 5785MHz Ant1



PSD NVNT ac20 5825MHz Ant1



PSD NVNT ac40 5190MHz Ant1

PSD NVNT ac40 5230MHz Ant1

PSD NVNT ac40 5270MHz Ant1

PSD NVNT ac40 5310MHz Ant1

PSD NVNT ac40 5510MHz Ant1

PSD NVNT ac40 5550MHz Ant1

PSD NVNT ac40 5630MHz Ant1

PSD NVNT ac40 5710MHz Ant1

PSD NVNT ac40 5755MHz Ant1

PSD NVNT ac40 5795MHz Ant1

A.5. Frequency Stability

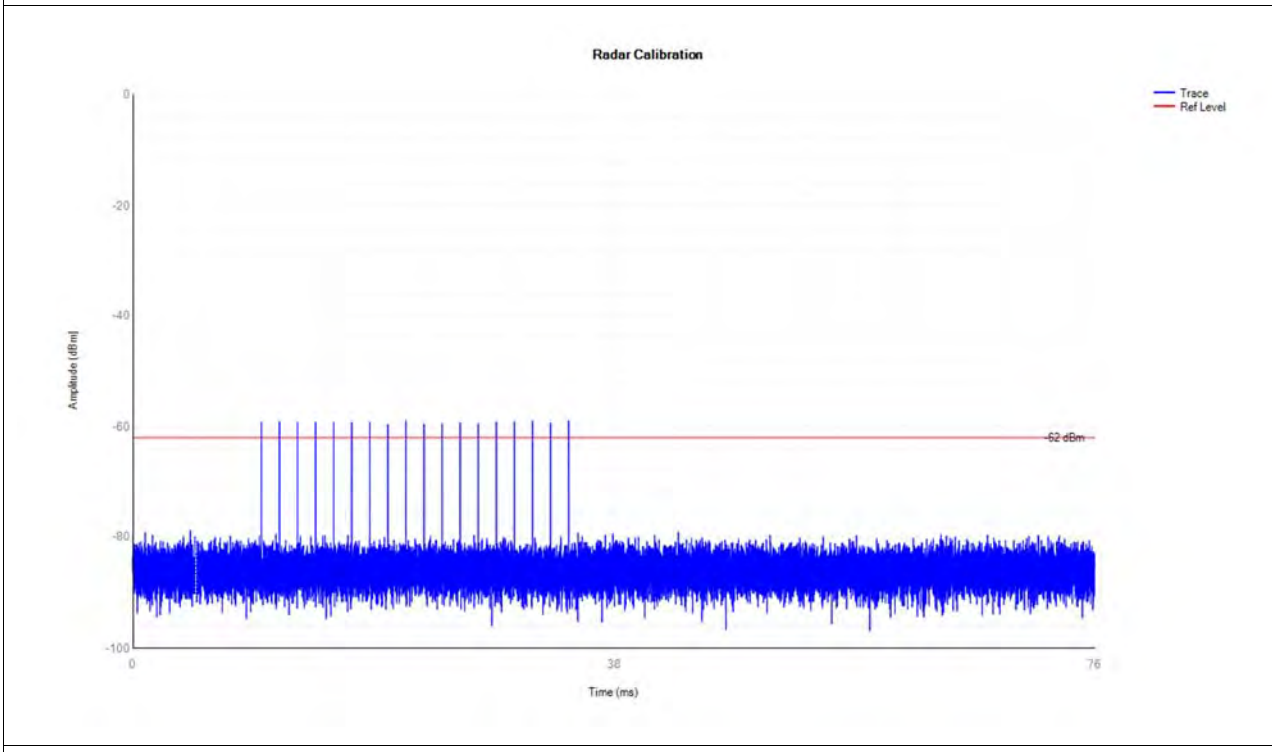
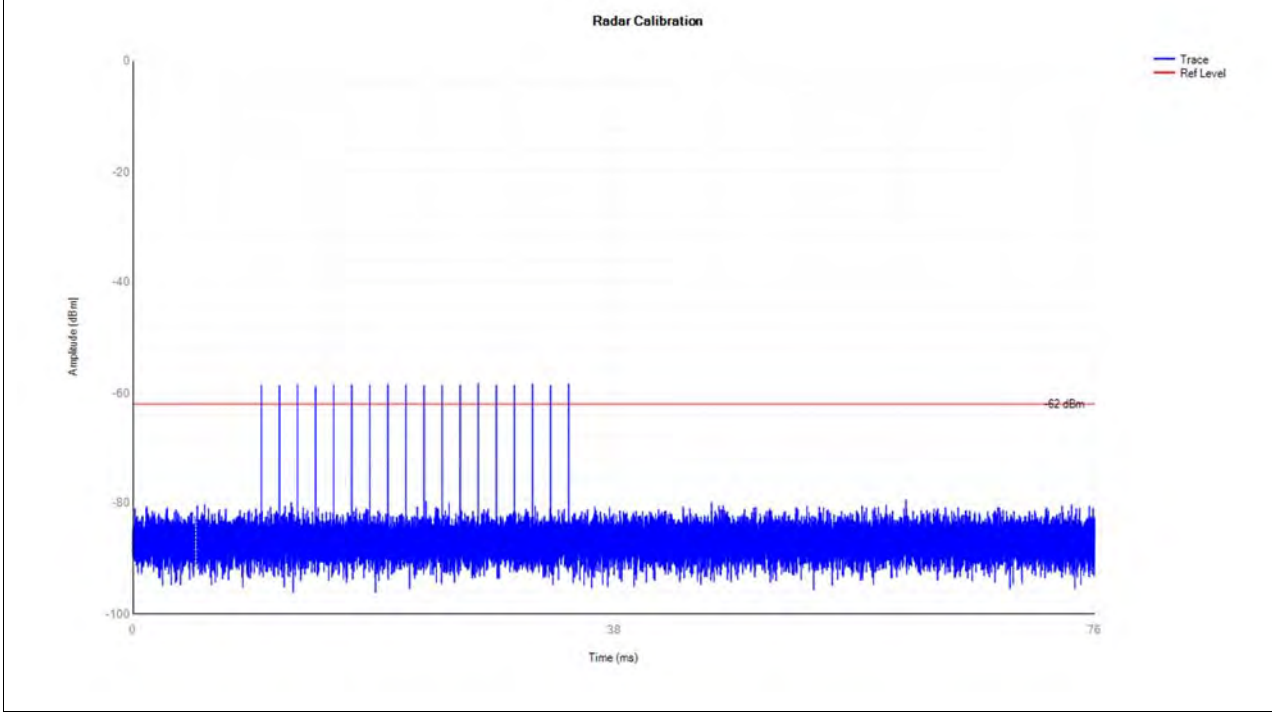
Condition	Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
20C 3V	a	5180	Ant1	5179.993	-7000	-1.35	25	Pass
20C 3.8V	a	5180	Ant1	5179.993	-7000	-1.35	25	Pass
20C 4.425V	a	5180	Ant1	5179.993	-7000	-1.35	25	Pass
-20C 4.425V	a	5180	Ant1	5179.993	-7000	-1.35	25	Pass
-10C 4.425V	a	5180	Ant1	5179.993	-7000	-1.35	25	Pass
0C 4.425V	a	5180	Ant1	5179.993	-7000	-1.35	25	Pass
10C 4.425V	a	5180	Ant1	5179.993	-7000	-1.35	25	Pass
30C 4.425V	a	5180	Ant1	5179.993	-7000	-1.35	25	Pass
40C 4.425V	a	5180	Ant1	5179.993	-7000	-1.35	25	Pass
50C 4.425V	a	5180	Ant1	5179.993	-7000	-1.35	25	Pass
20C 3V	a	5260	Ant1	5259.992	-8000	-1.52	25	Pass
20C 3.8V	a	5260	Ant1	5259.992	-8000	-1.52	25	Pass
20C 4.425V	a	5260	Ant1	5259.991	-9000	-1.71	25	Pass
-20C 4.425V	a	5260	Ant1	5259.991	-9000	-1.71	25	Pass
-10C 4.425V	a	5260	Ant1	5259.991	-9000	-1.71	25	Pass
0C 4.425V	a	5260	Ant1	5259.991	-9000	-1.71	25	Pass
10C 4.425V	a	5260	Ant1	5259.991	-9000	-1.71	25	Pass
30C 4.425V	a	5260	Ant1	5259.991	-9000	-1.71	25	Pass
40C 4.425V	a	5260	Ant1	5259.991	-9000	-1.71	25	Pass
50C 4.425V	a	5260	Ant1	5259.991	-9000	-1.71	25	Pass
20C 3V	a	5500	Ant1	5499.989	-11000	-2	25	Pass
20C 3.8V	a	5500	Ant1	5499.989	-11000	-2	25	Pass
20C 4.425V	a	5500	Ant1	5499.989	-11000	-2	25	Pass
-20C 4.425V	a	5500	Ant1	5499.989	-11000	-2	25	Pass
-10C 4.425V	a	5500	Ant1	5499.989	-11000	-2	25	Pass
0C 4.425V	a	5500	Ant1	5499.989	-11000	-2	25	Pass
10C 4.425V	a	5500	Ant1	5499.989	-11000	-2	25	Pass
30C 4.425V	a	5500	Ant1	5499.989	-11000	-2	25	Pass
40C 4.425V	a	5500	Ant1	5499.989	-11000	-2	25	Pass
50C 4.425V	a	5500	Ant1	5499.989	-11000	-2	25	Pass
20C 3V	a	5745	Ant1	5744.987	-13000	-2.26	25	Pass
20C 3.8V	a	5745	Ant1	5744.987	-13000	-2.26	25	Pass
20C 4.425V	a	5745	Ant1	5744.987	-13000	-2.26	25	Pass
-20C 4.425V	a	5745	Ant1	5744.987	-13000	-2.26	25	Pass

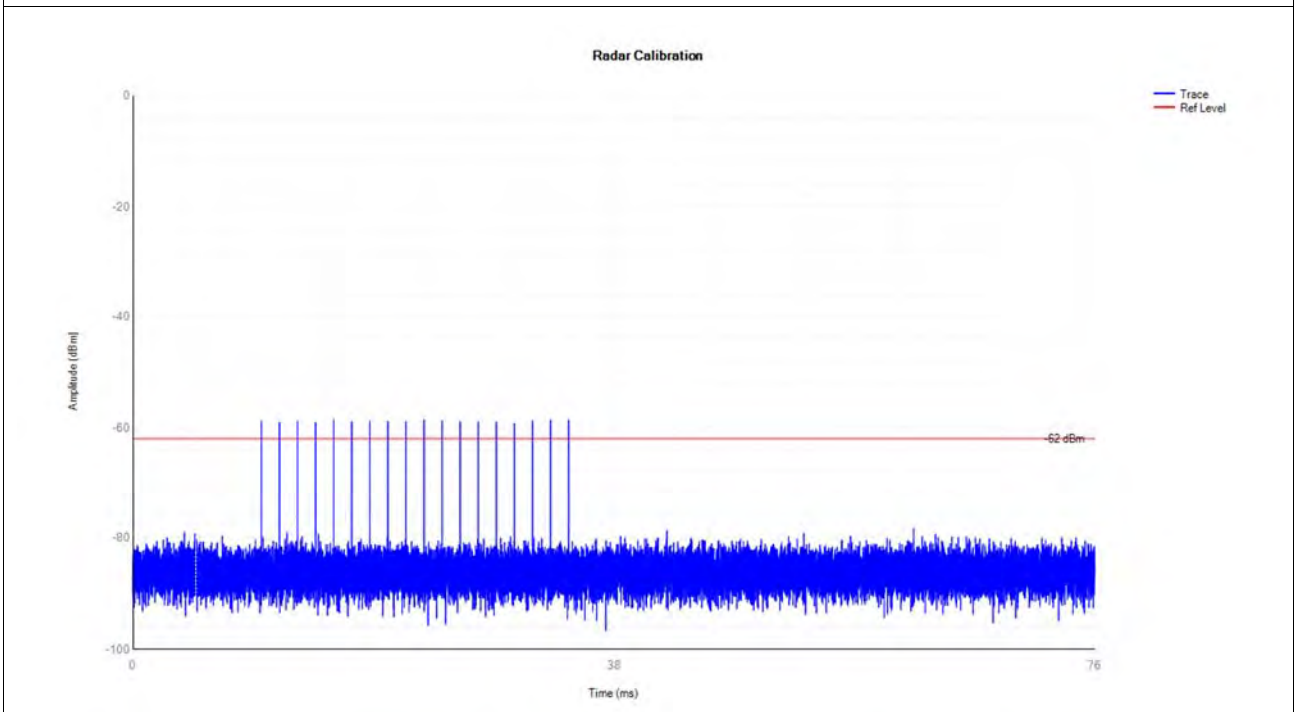
-10C 4.425V	a	5745	Ant1	5744.987	-13000	-2.26	25	Pass
0C 4.425V	a	5745	Ant1	5744.987	-13000	-2.26	25	Pass
10C 4.425V	a	5745	Ant1	5744.987	-13000	-2.26	25	Pass
30C 4.425V	a	5745	Ant1	5744.987	-13000	-2.26	25	Pass
40C 4.425V	a	5745	Ant1	5744.987	-13000	-2.26	25	Pass
50C 4.425V	a	5745	Ant1	5744.987	-13000	-2.26	25	Pass

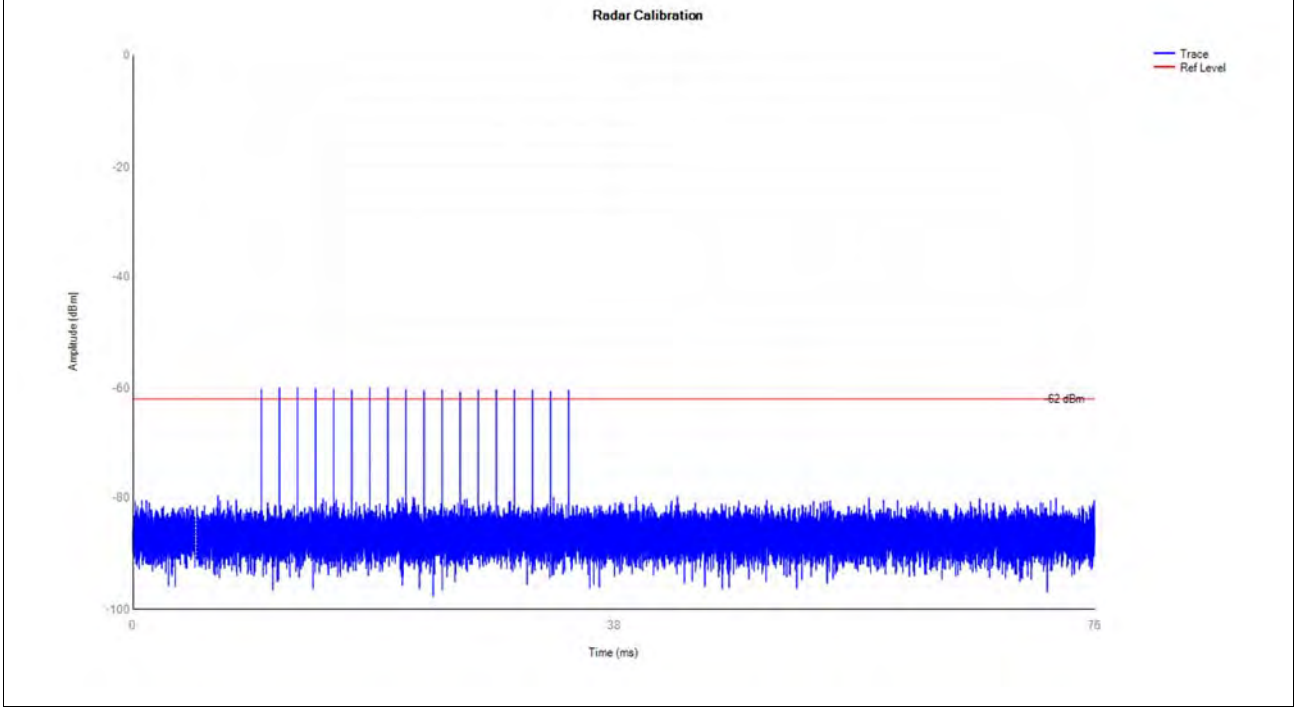
A.6. Dynamic Frequency Selection

Detection Thresholds

Mode	Frequency (MHz)	Type	Result	Verdict
a	5320	DFS_FCC_T0	See test Graph	Pass
a	5500	DFS_FCC_T0	See test Graph	Pass
ac40	5310	DFS_FCC_T0	See test Graph	Pass
ac40	5510	DFS_FCC_T0	See test Graph	Pass

Test Graphs
5320MHz DFS_FCC_T0

5500MHz DFS_FCC_T0


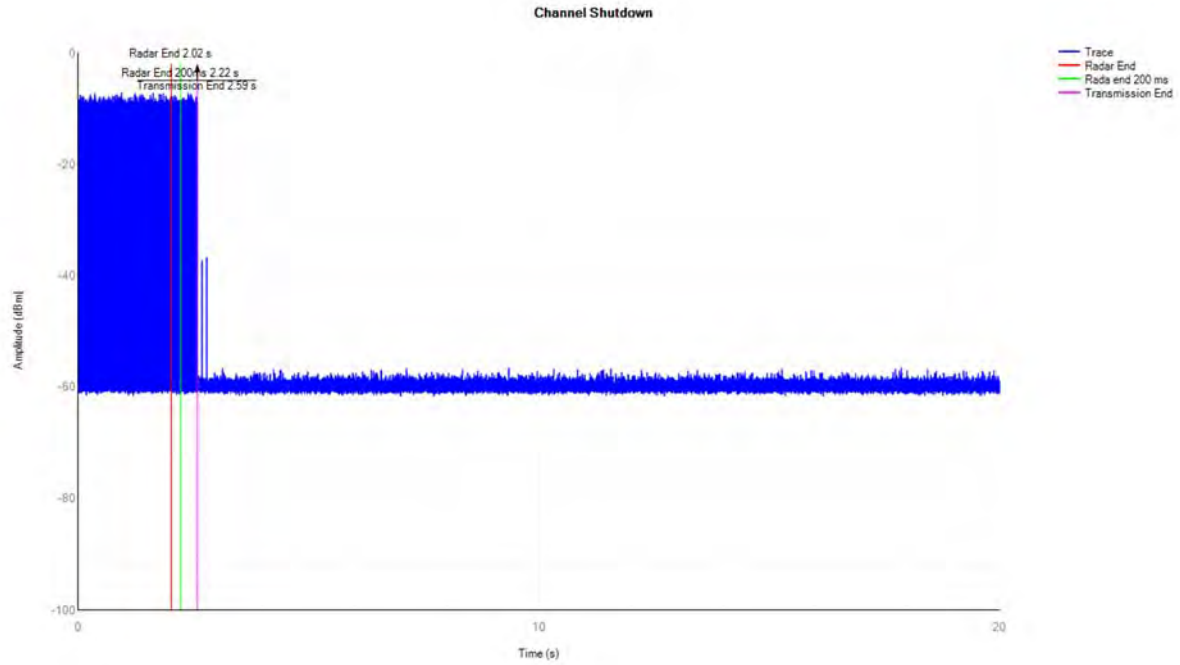
5310MHz DFS_FCC_T0


5510MHz DFS_FCC_T0


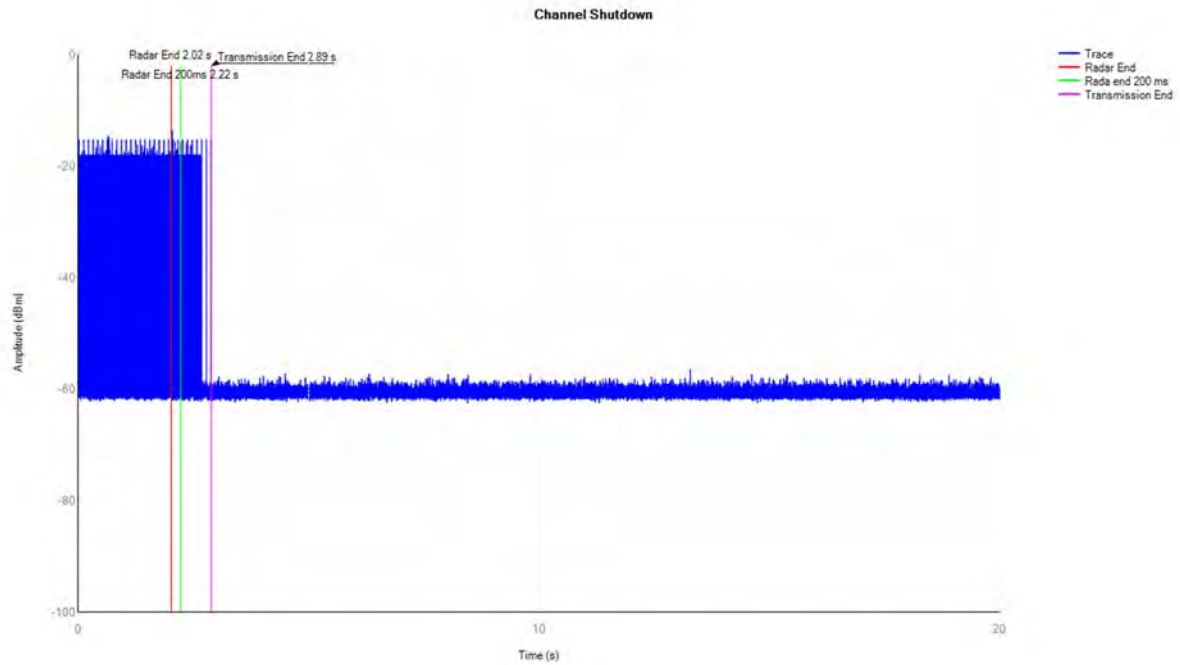
Channel Move Time and Channel Closing Transmission Time

Mode	Frequency (MHz)	Channel Move Time (s)	Limit Channel Move Time (s)	Close Transmission Time (s)	Limit Close Transmission Time (s)	Close Transmission Time after 200ms(s)	Limit Close Transmission Time after 200ms (s)	Verdict
a	5320	0.562	10	0.077	0.26	0.055	0.06	Pass
a	5500	0.861	10	0.059	0.26	0.051	0.06	Pass
ac40	5310	0.866	10	0.068	0.26	0.049	0.06	Pass
ac40	5510	0.592	10	0.060	0.26	0.044	0.06	Pass

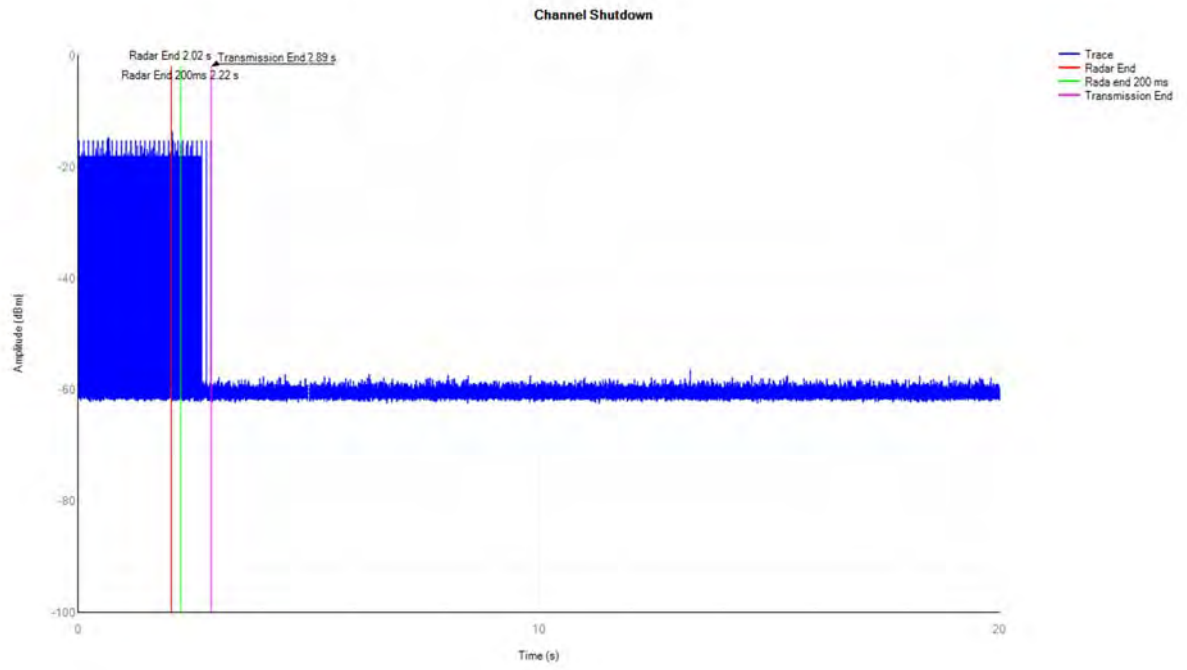
Test Graphs
a 5320MHz Shutdown



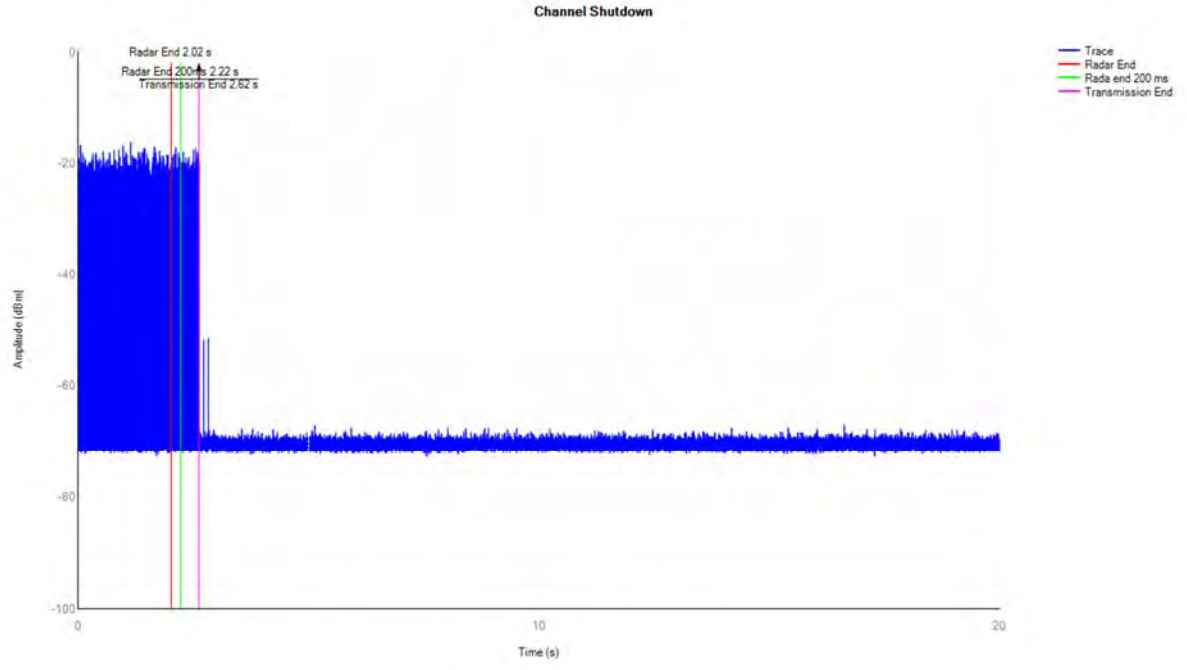
a 5500MHz Shutdown



Ac40 5310MHz Shutdown



ac40 5510MHz Shutdown

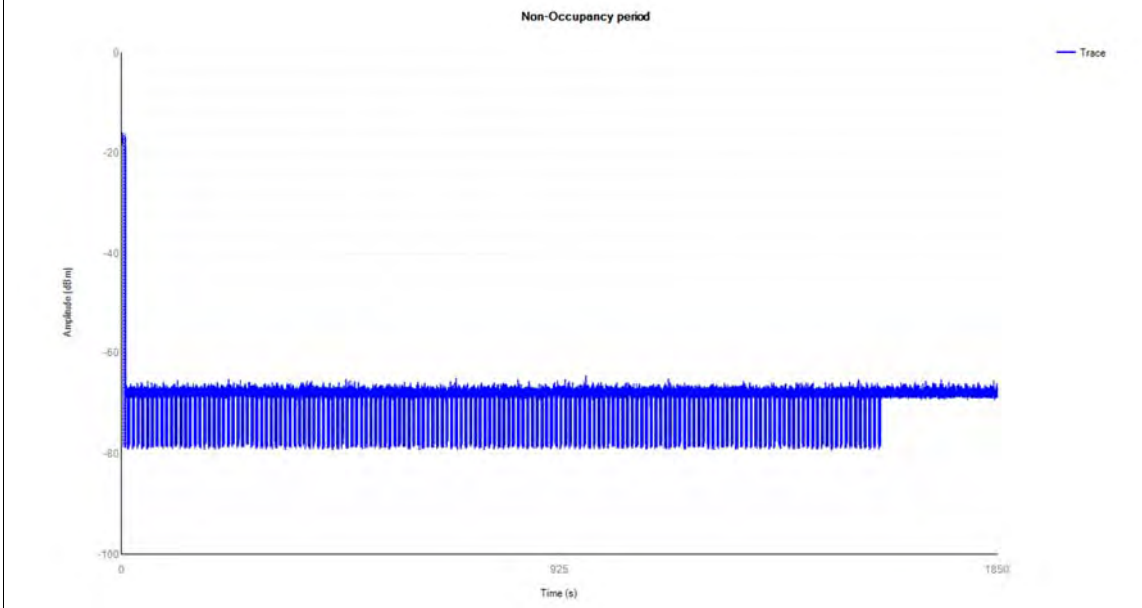


Non-Occupancy Period

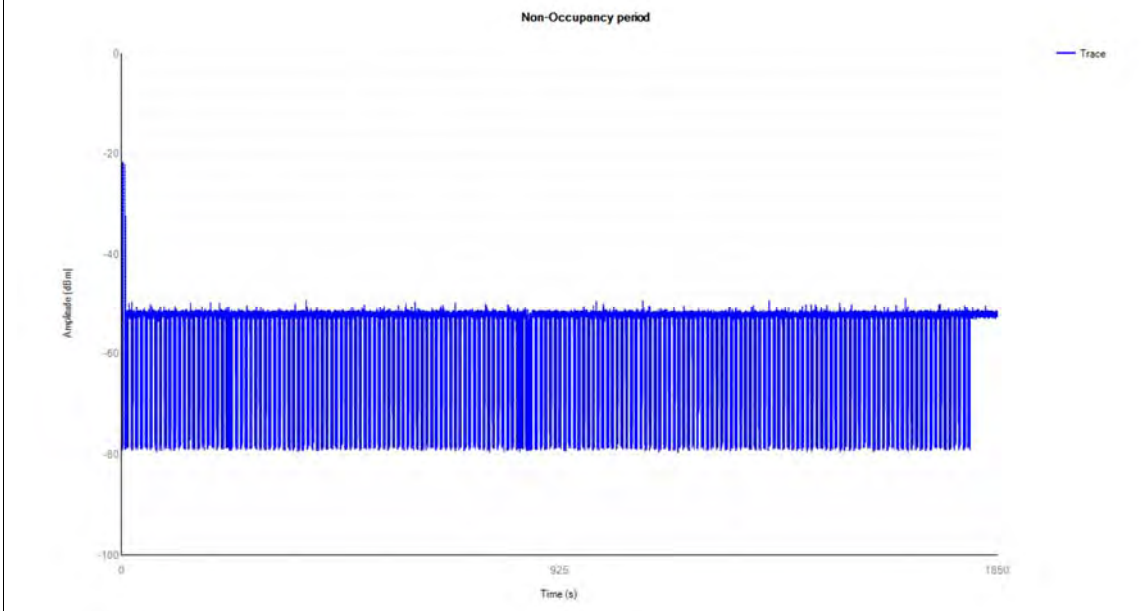
Mode	Frequency (MHz)	Result	Verdict
a	5320	See test Graph	Pass
a	5500	See test Graph	Pass

Test Graphs

a 5320MHz Non-Occupancy



a 5500MHz Non-Occupancy



A.7. 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 + USB CABLE + PC + WIFI TX

Test voltage: AC 120V/60Hz

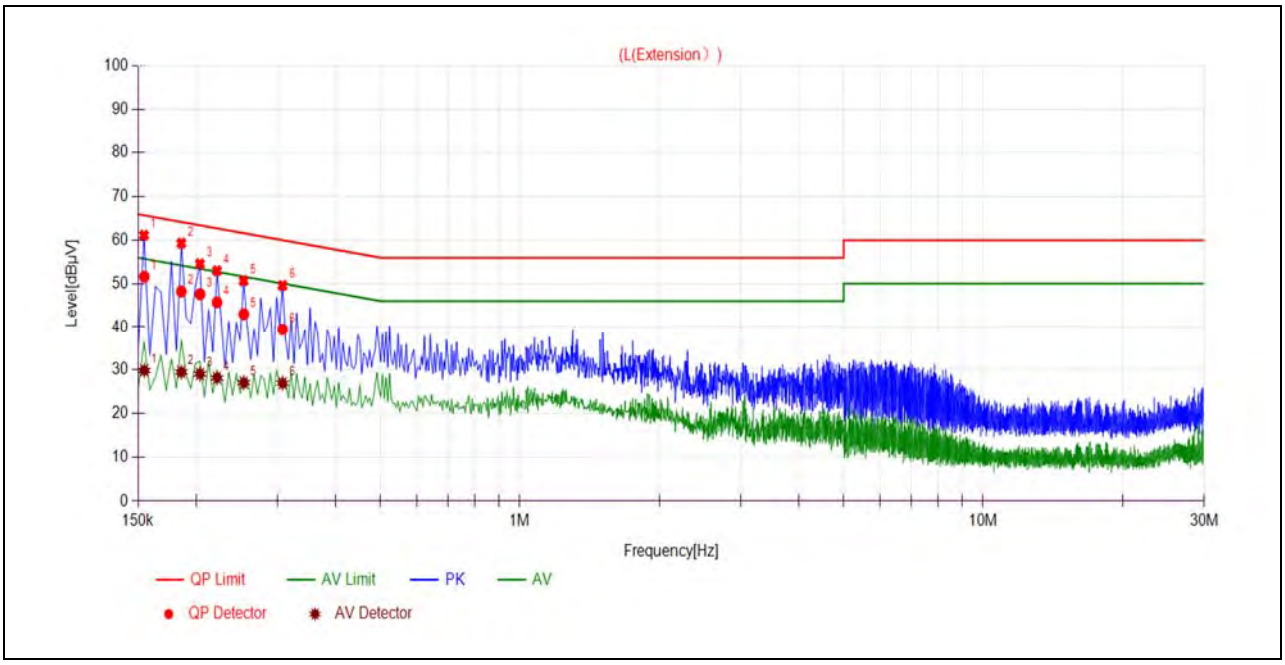
The measurement results are obtained as below:

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

U_R: Receiver Reading

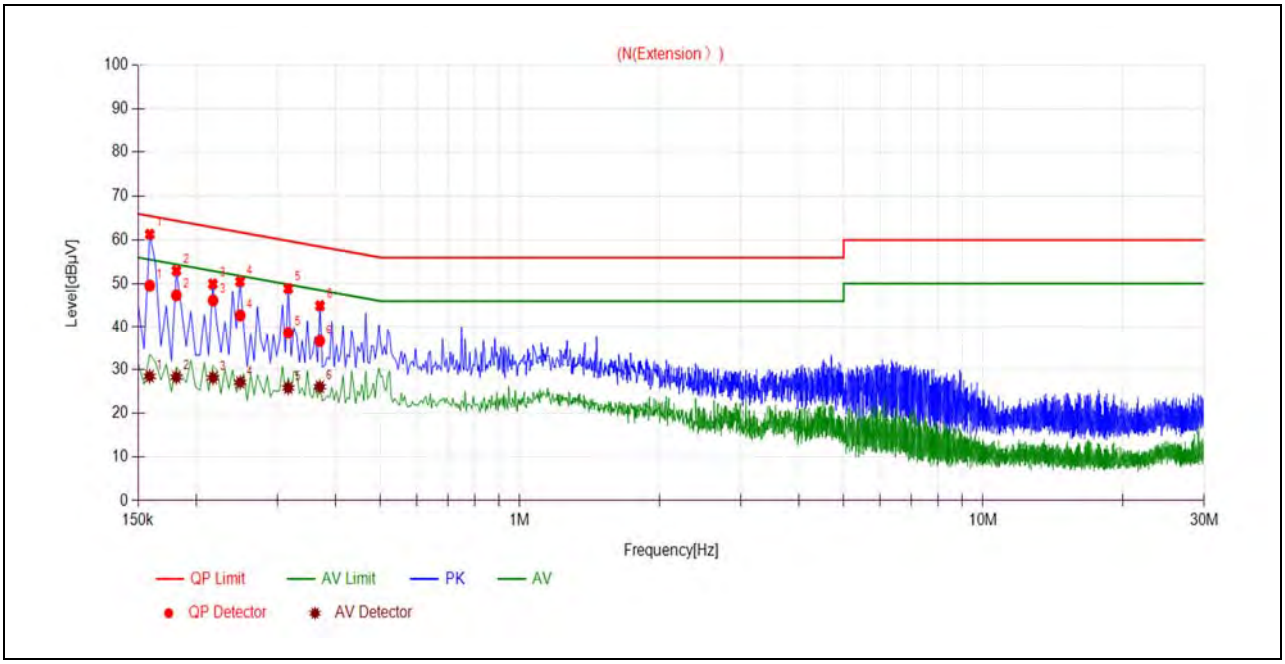
A_{Factor}: Voltage division factor of LISN

B. Test Plot:



(L Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1547	51.64	29.86	65.75	55.75	Line	PASS
2	0.1859	48.21	29.49	64.22	54.22		PASS
3	0.2041	47.59	29.05	63.44	53.44		PASS
4	0.2220	45.72	28.13	62.75	52.75		PASS
5	0.2536	42.97	27.05	61.64	51.64		PASS
6	0.3076	39.38	26.93	60.04	50.04		PASS



(N Phase)

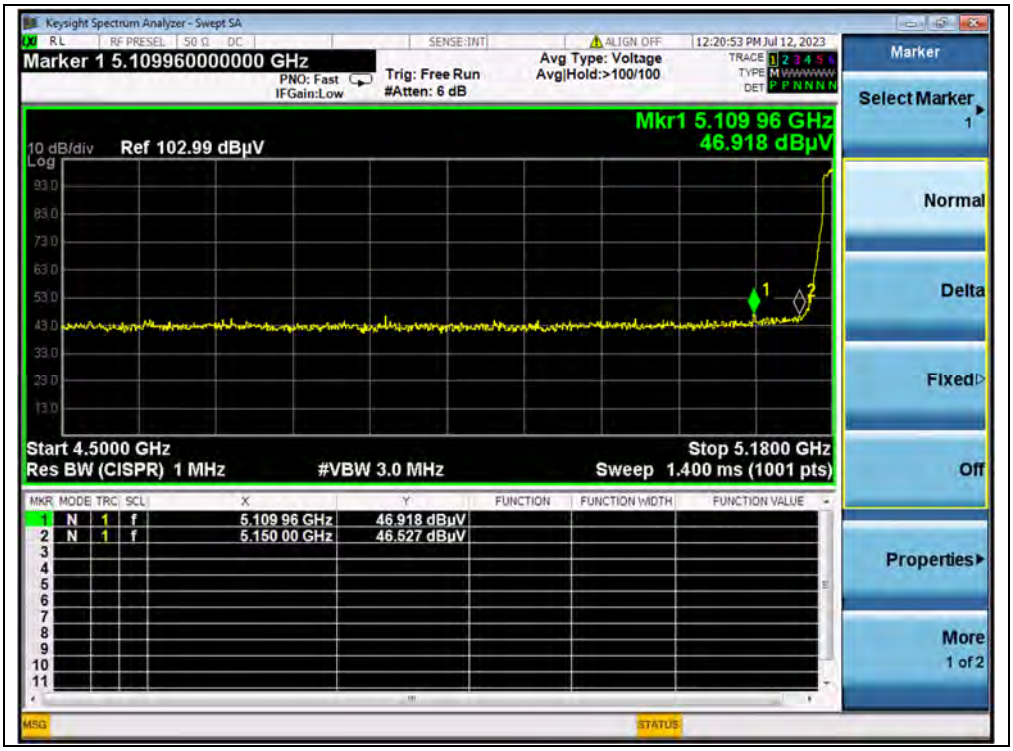
No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1589	49.53	28.49	65.52	55.52	Neutral	PASS
2	0.1814	47.32	28.29	64.42	54.42		PASS
3	0.2177	46.14	28.14	62.91	52.91		PASS
4	0.2492	42.70	27.08	61.78	51.78		PASS
5	0.3163	38.60	25.82	59.80	49.80		PASS
6	0.3702	36.65	26.08	58.50	48.50		PASS

A.8. Restricted Frequency Bands

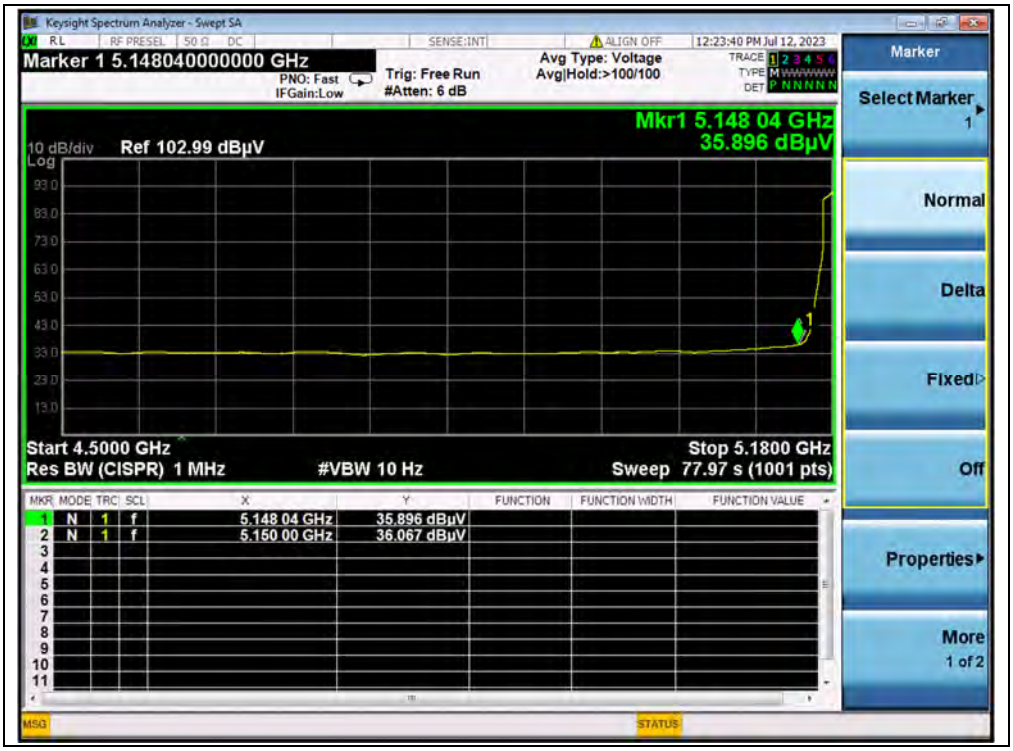
The lowest and highest channels are tested to verify the Restricted Frequency Bands.
The measurement results are obtained as below:
E [dBμV/m] =U_R + A_T + A_{Factor} [dB]; A_T =$L_{Cable\ loss}$ [dB]-G_{preamp} [dB]
A_T: Total correction Factor except Antenna
U_R: Receiver Reading
G_{preamp}: Preamplifier 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

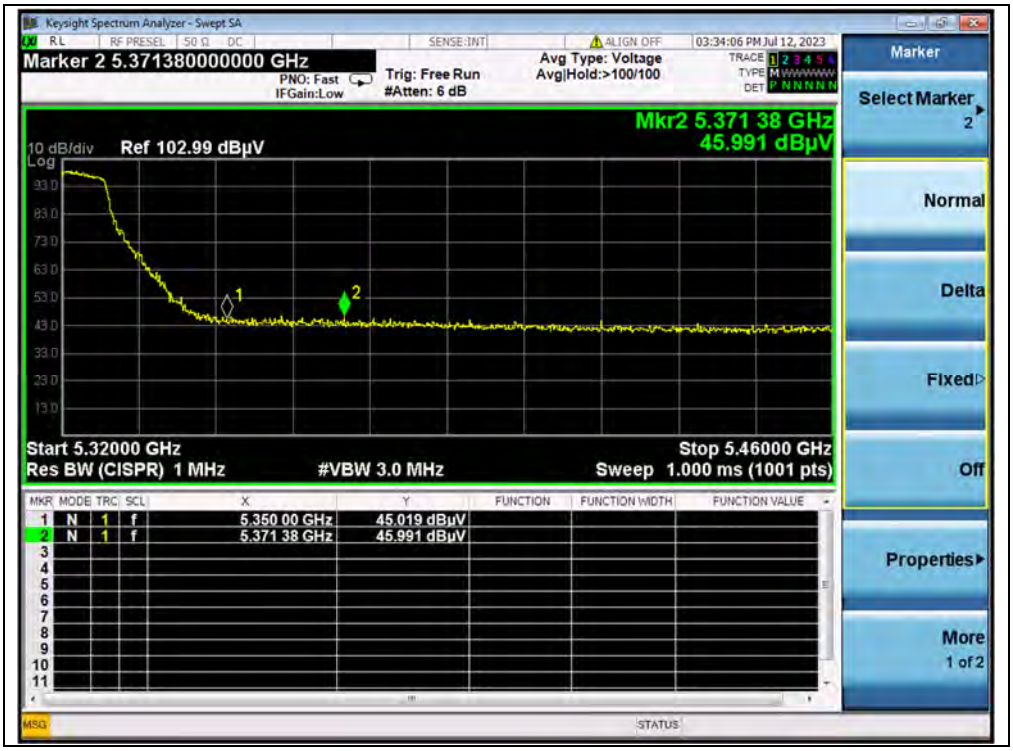
Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBμV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
36	5109.96	PK	46.92	-19.54	32.20	59.58	74	PASS
36	5150.00	AV	36.07	-19.54	32.20	48.73	54	PASS
64	5371.38	PK	45.99	-18.80	32.20	59.39	74	PASS
64	5350.00	AV	35.23	-18.80	32.20	48.63	54	PASS
100	5465.00	PK	47.77	-19.20	32.20	60.77	68.23	PASS
100	5460.00	AV	35.26	-19.20	32.20	48.26	54	PASS
144	5725.00	PK	48.53	-19.20	32.20	61.53	68.23	PASS
149	5725.00	PK	57.01	-19.01	32.20	70.20	122.23	PASS
165	5850.00	PK	45.79	-19.01	32.20	58.98	122.23	PASS



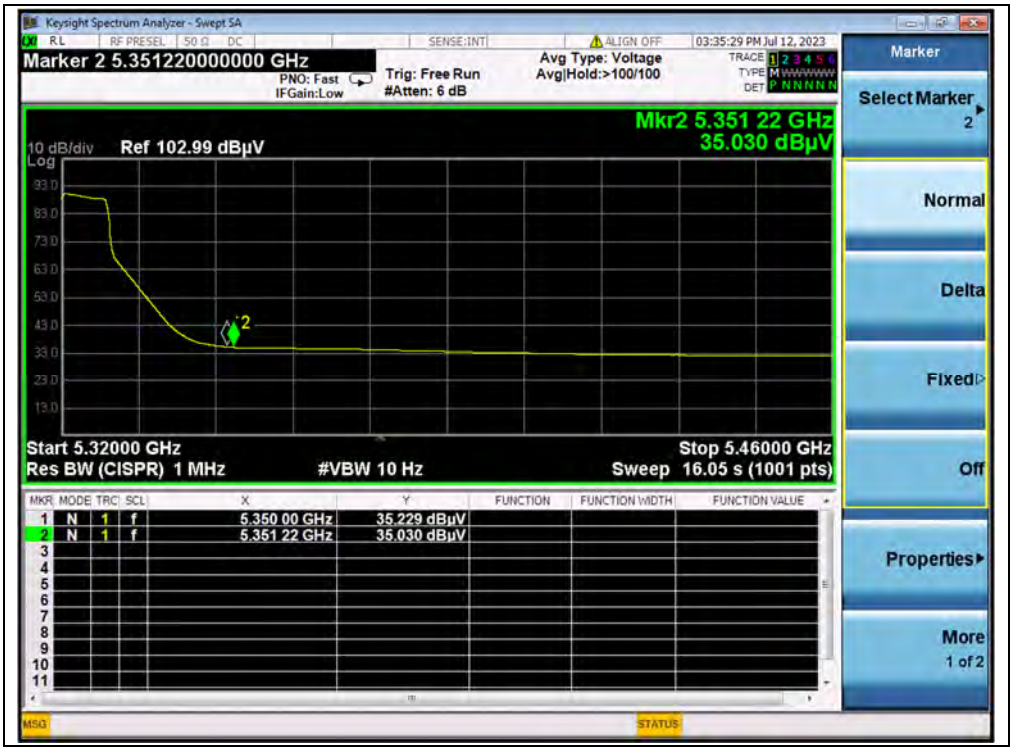
(PEAK, Channel 36, 802.11a)



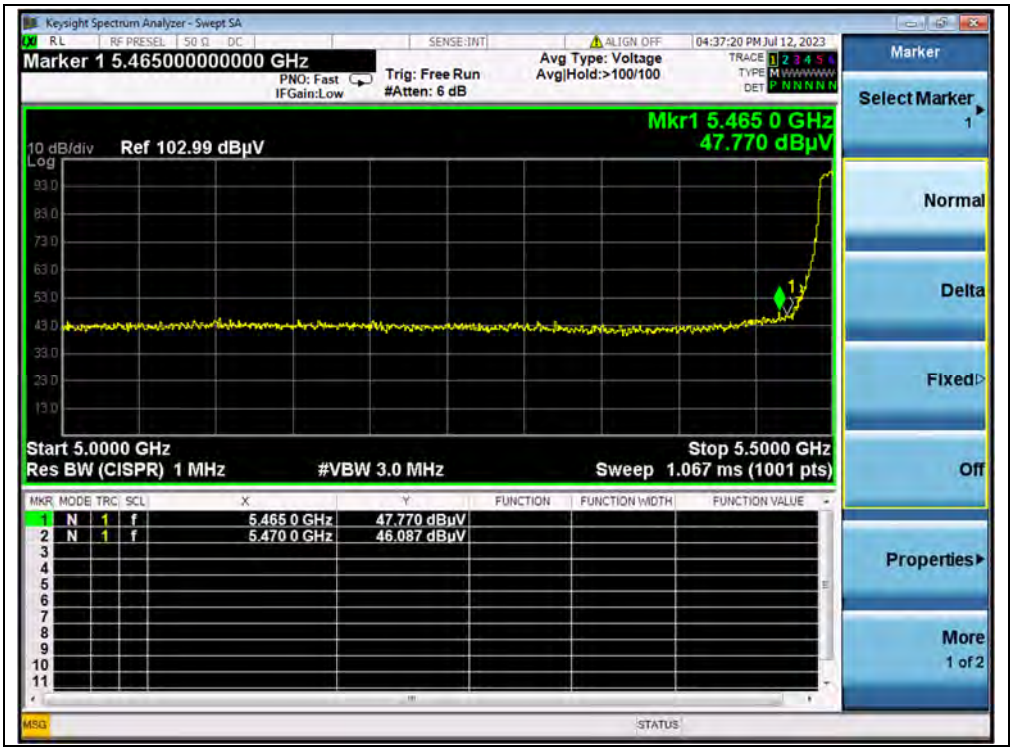
(AVERAGE, Channel 36, 802.11a)



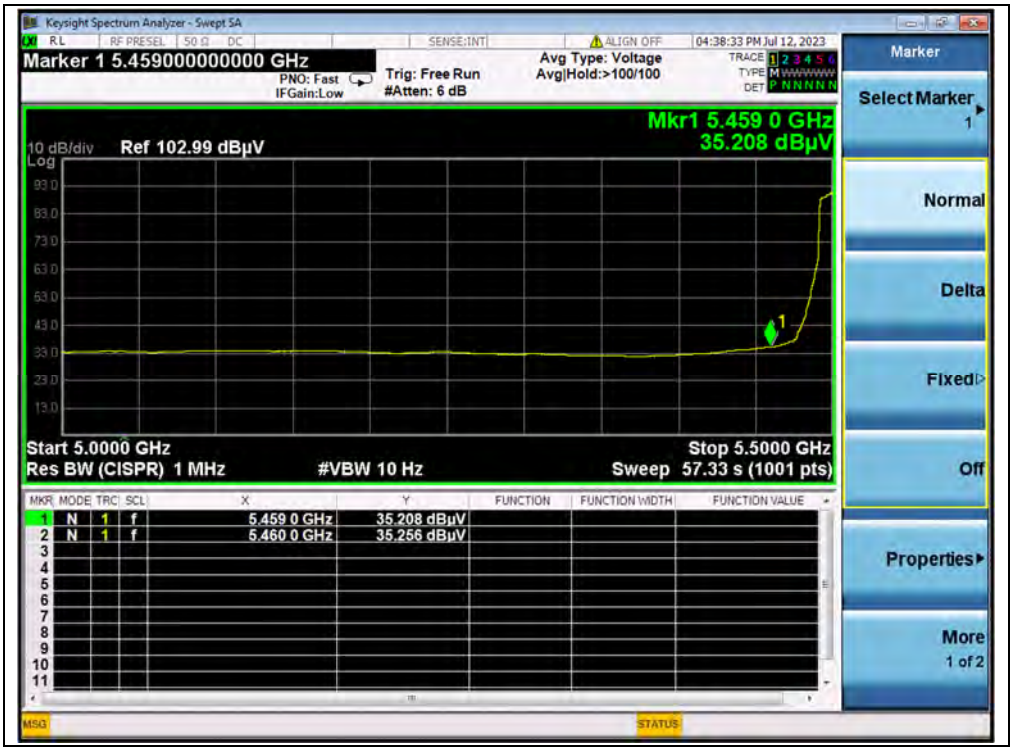
(PEAK, Channel 64, 802.11a)



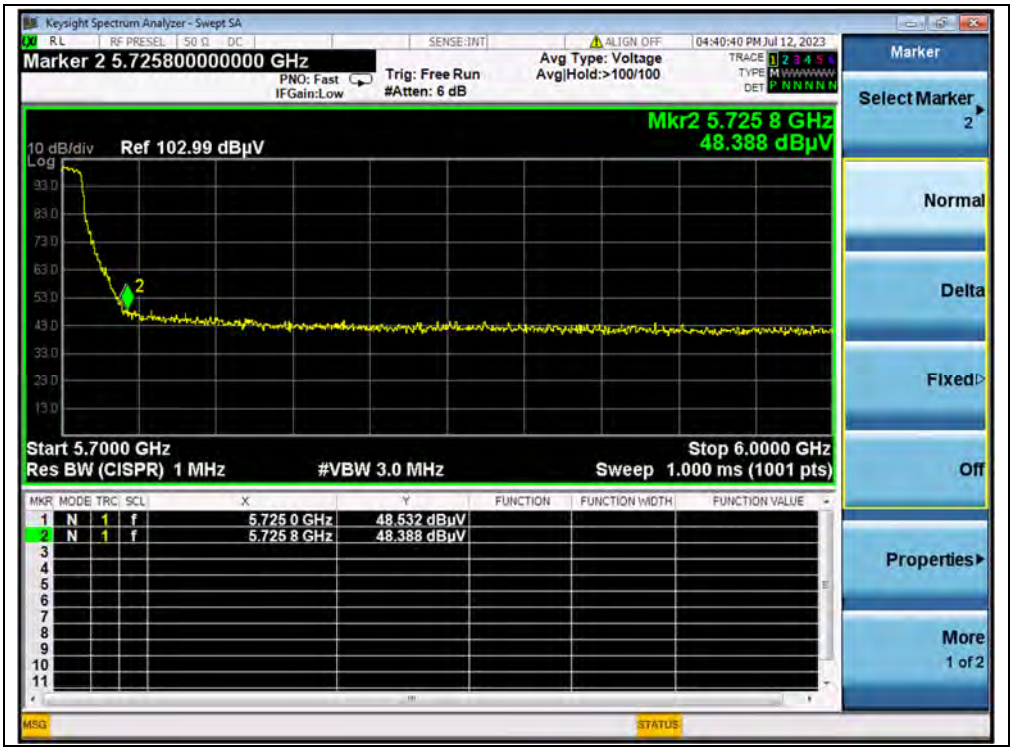
(AVERAGE, Channel 64, 802.11a)



(PEAK, Channel 100, 802.11a)



(AVERAGE, Channel 100, 802.11a)



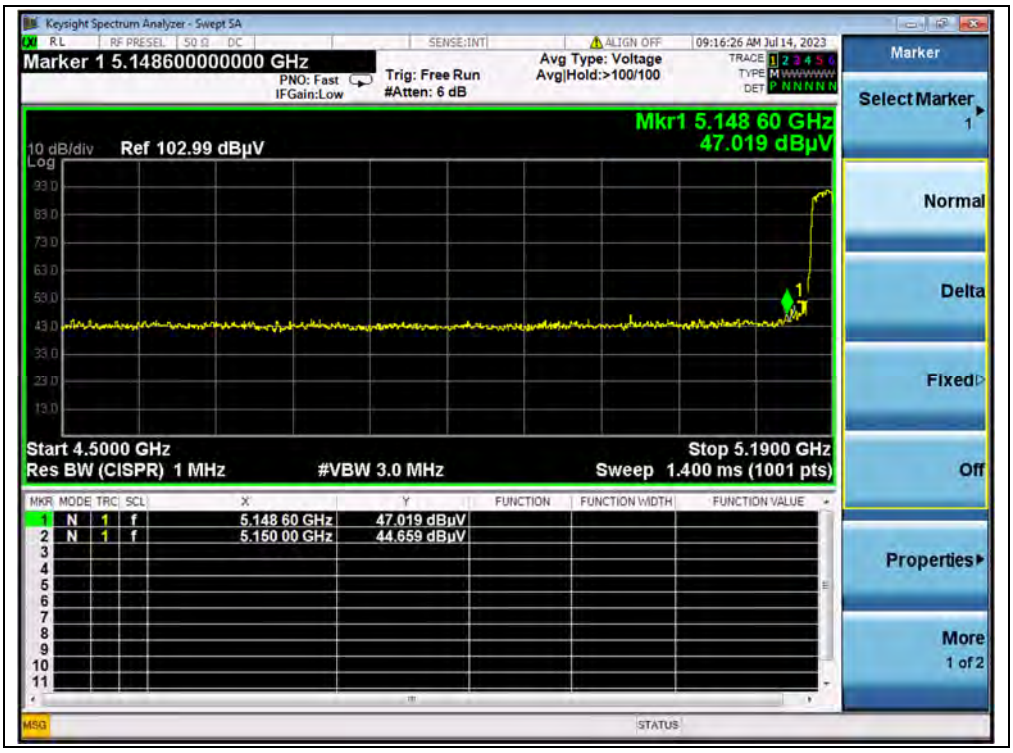
(PEAK, Channel 144, 802.11a)

(PEAK, Channel 149, 802.11a)

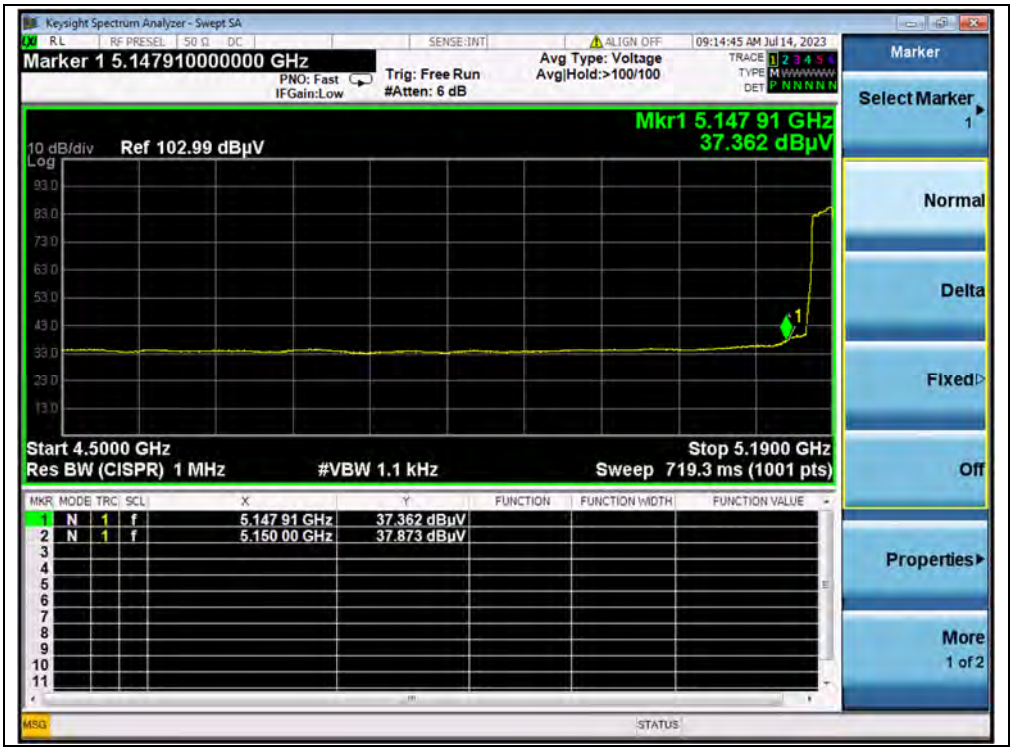
(PEAK, Channel 165, 802.11a)

802.11n (HT40) Mode

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	5148.60	PK	47.02	-19.54	32.20	59.68	74	PASS
38	5150.00	AV	37.87	-19.54	32.20	50.53	54	PASS
62	5350.00	PK	44.79	-18.80	32.20	58.19	74	PASS
62	5350.80	AV	36.42	-18.80	32.20	49.82	54	PASS
102	5466.14	PK	45.77	-19.20	32.20	58.77	68.23	PASS
102	5460.00	AV	36.01	-19.20	32.20	49.01	54	PASS
142	5725.77	PK	50.33	-19.20	32.20	63.33	68.23	PASS
151	5725.00	PK	57.32	-19.01	32.20	70.51	122.23	PASS
159	5850.00	PK	47.11	-19.01	32.20	60.30	122.23	PASS

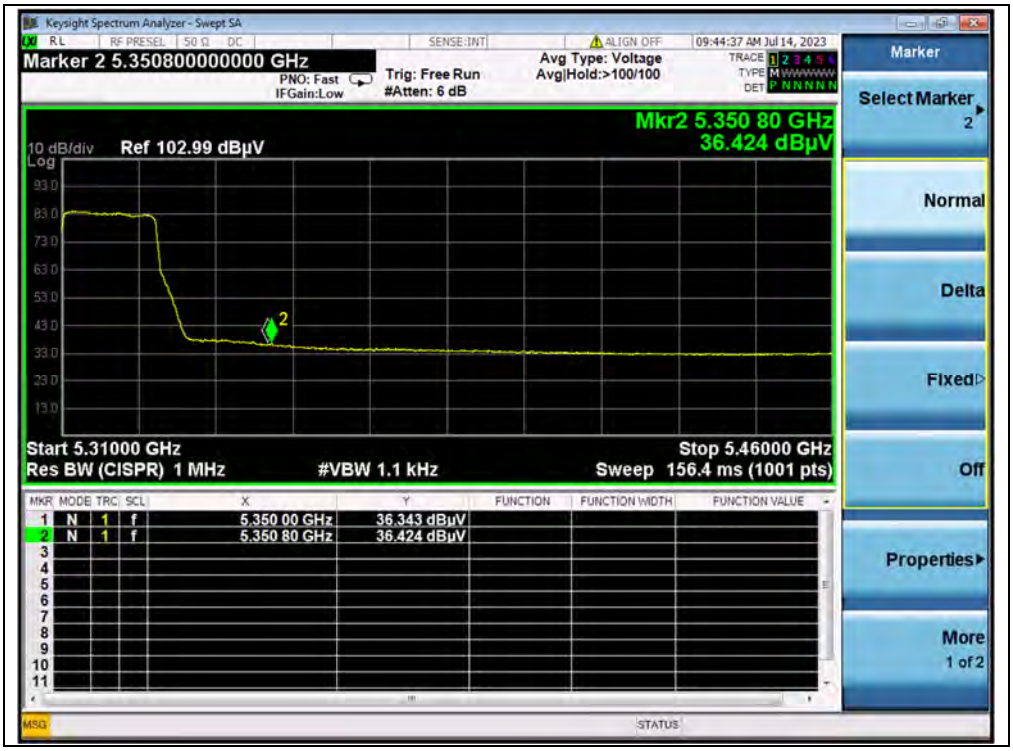


(PEAK, Channel 38, 802.11n (HT40))

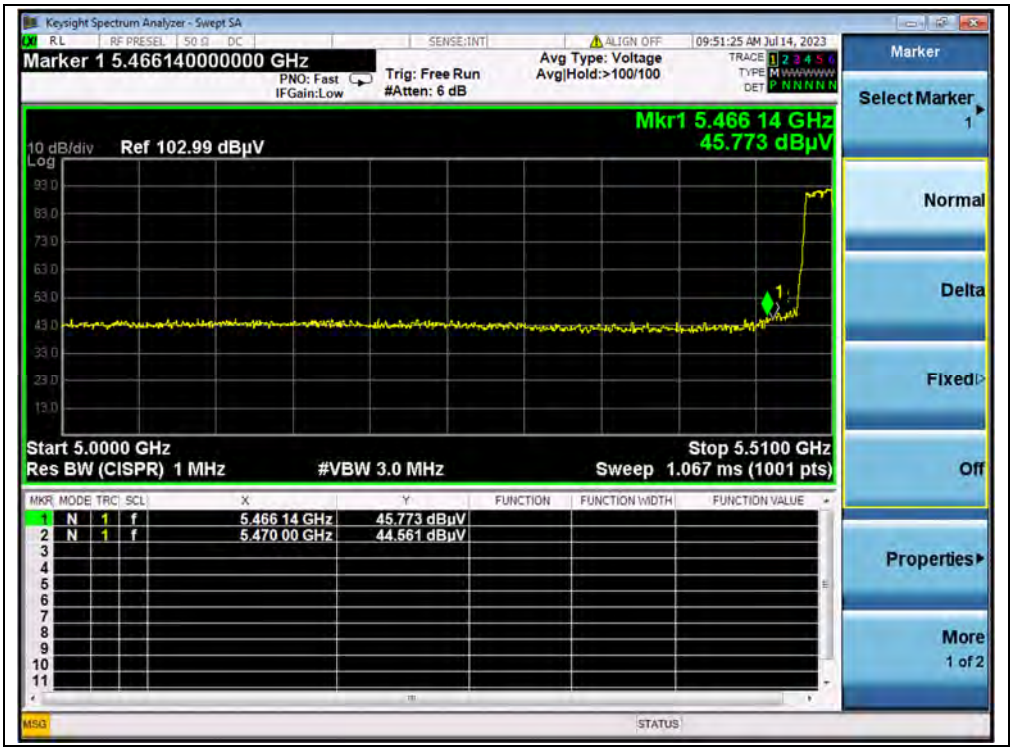


(AVERAGE, Channel 38, 802.11n (HT40))

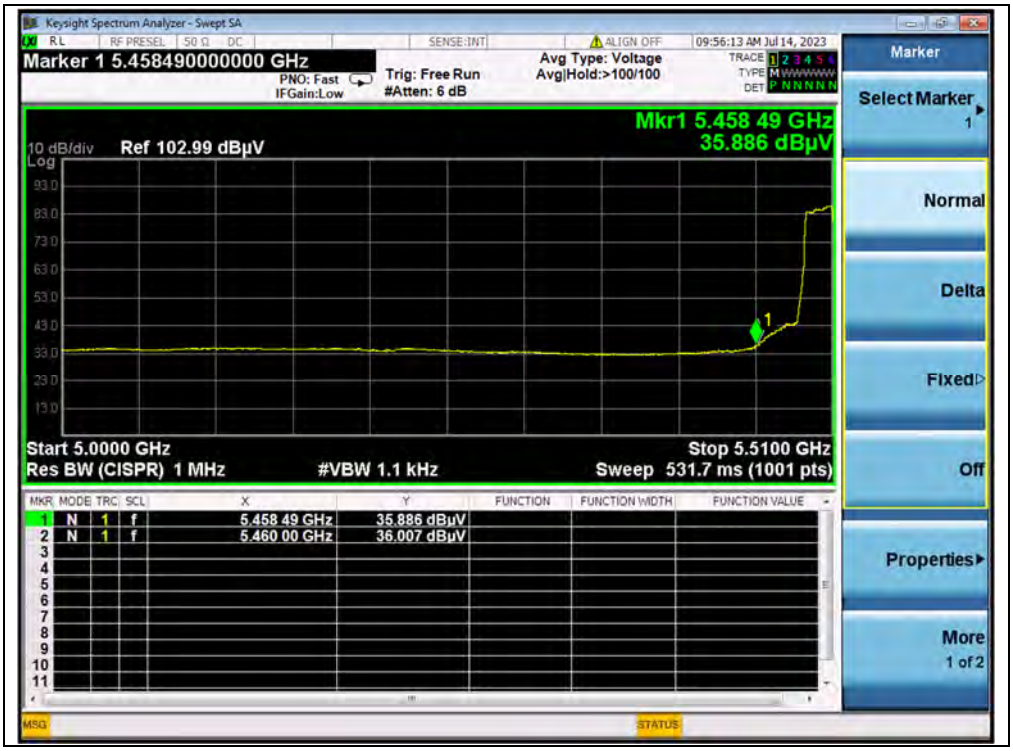
(PEAK, Channel 62, 802.11n (HT40))



(AVERAGE, Channel 62, 802.11n (HT40))



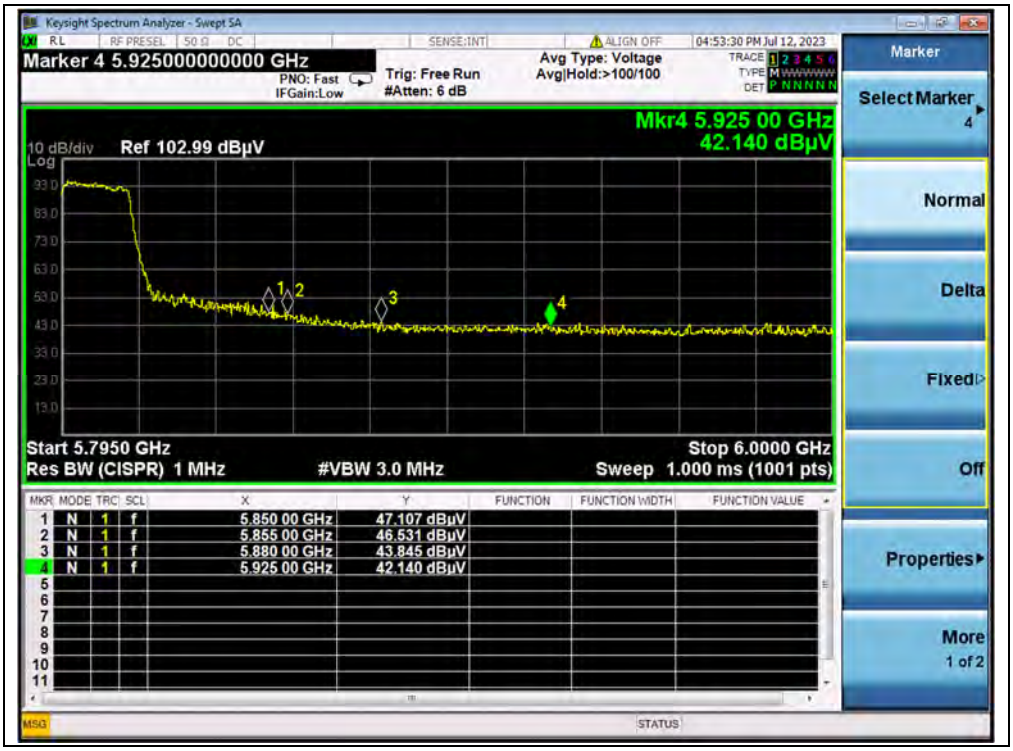
(PEAK, Channel 102, 802.11n (HT40))



(AVERAGE, Channel 102, 802.11n (HT40))

(PEAK, Channel 142, 802.11n (HT40))

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



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

A.9. 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:

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

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.

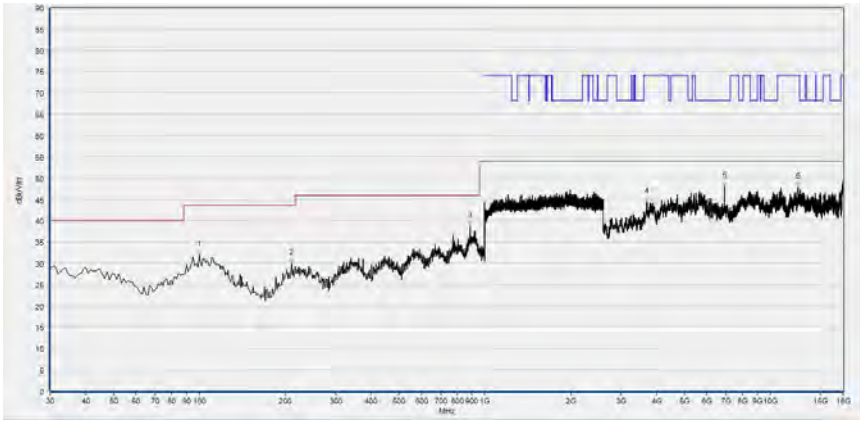
Note2: For the frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

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.

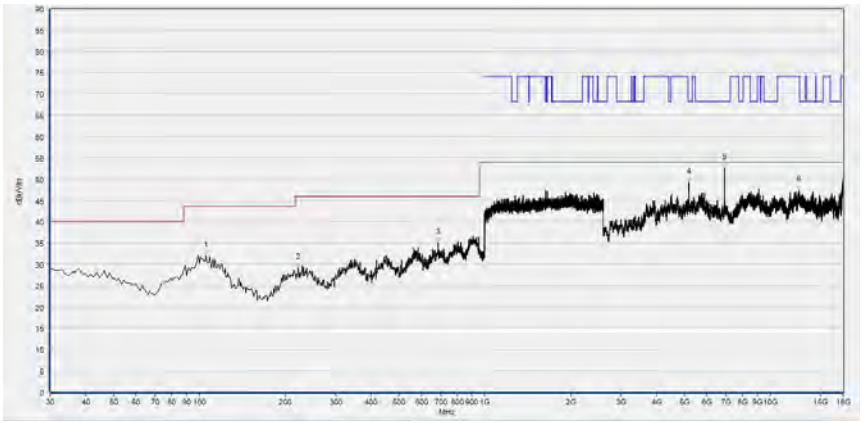
802.11a Mode

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
99.840	31.98	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
210.420	30.02	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
889.420	38.67	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
3687.240	44.38	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
6905.840	48.13	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12511.440	47.87	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

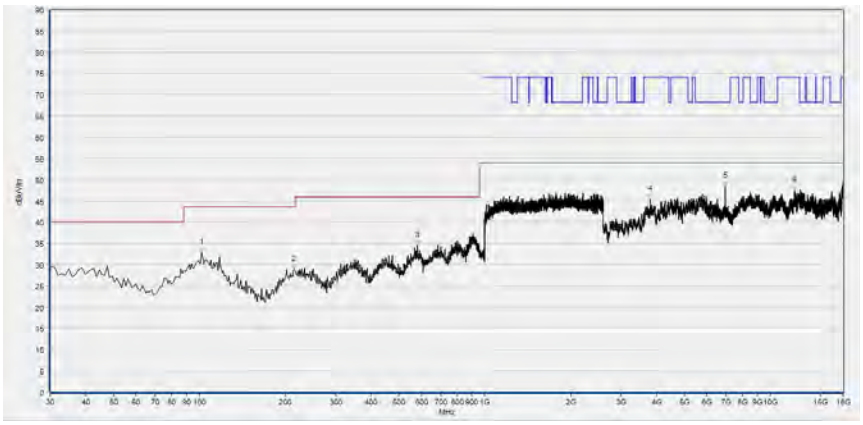
(Antenna Horizontal, 30MHz to 18GHz)



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
105.660	32.09	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
222.060	29.10	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
687.660	34.96	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
5177.960	49.25	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
6905.840	52.67	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12625.400	47.42	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

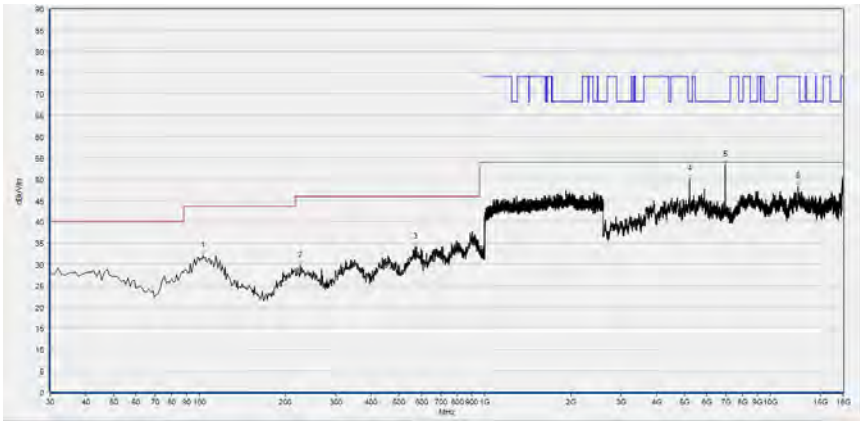
(Antenna Vertical, 30MHz to 18GHz)

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
101.780	32.87	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
214.300	28.91	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
580.960	34.53	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
3807.360	45.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
6961.280	48.49	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12163.400	47.48	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

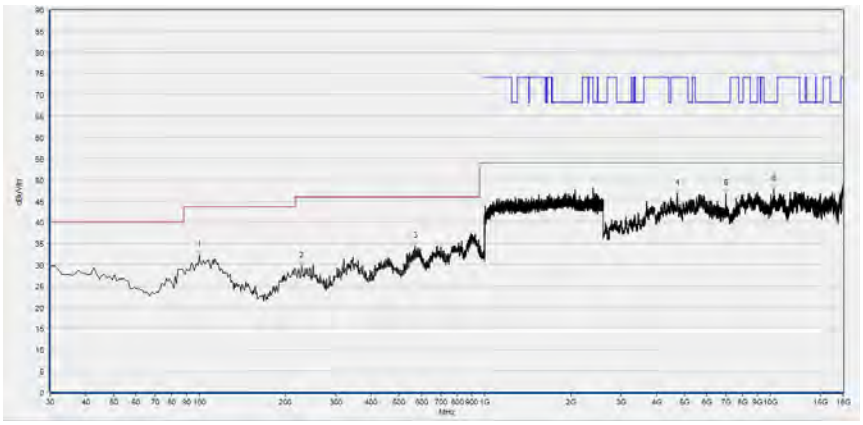
(Antenna Horizontal, 30MHz to 18GHz)



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
102.750	32.00	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
224.970	29.60	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
571.260	34.04	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
5218.000	50.00	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
6961.280	53.27	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12536.080	48.32	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

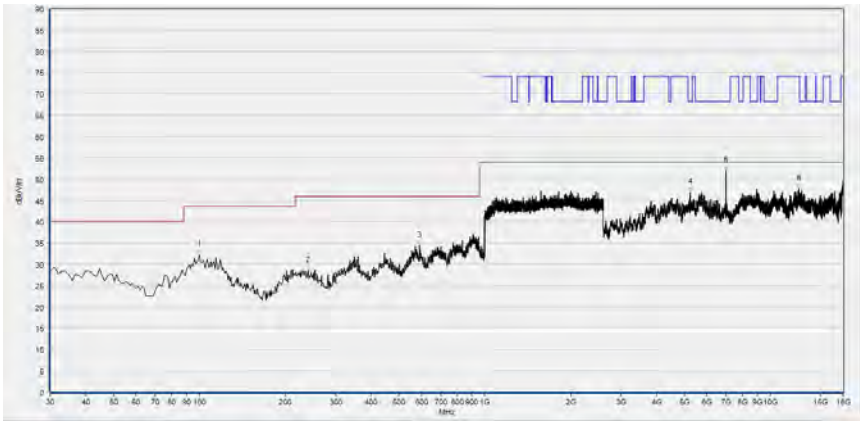
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 48



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
99.840	32.15	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
227.880	29.60	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
569.320	34.40	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
4722.120	46.69	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
6985.920	46.71	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
10309.240	47.79	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS

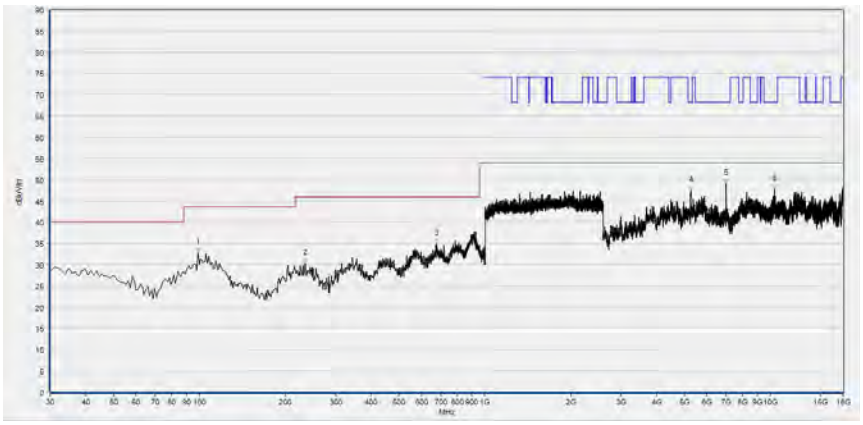
(Antenna Horizontal, 30MHz to 18GHz)



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
99.840	32.10	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
240.490	28.44	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
590.660	34.39	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
5242.640	46.86	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
6985.920	51.88	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12573.040	47.70	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

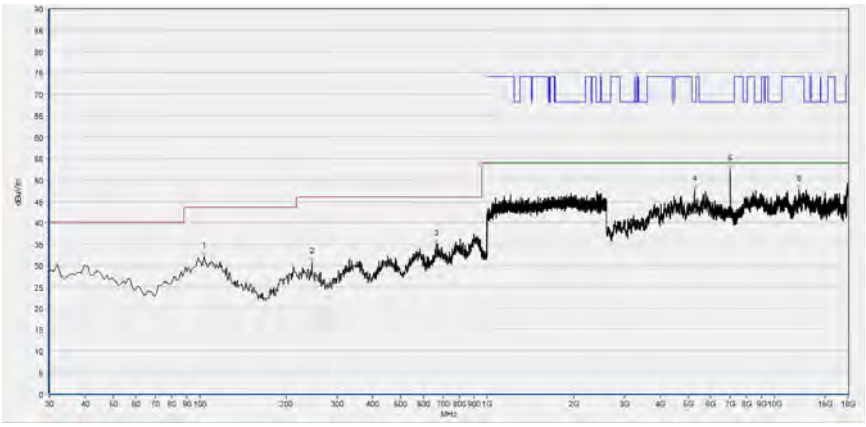
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 52



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
98.870	32.80	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
234.670	30.26	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
676.990	34.81	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
5267.280	47.36	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
7013.640	49.31	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
10333.880	47.74	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS

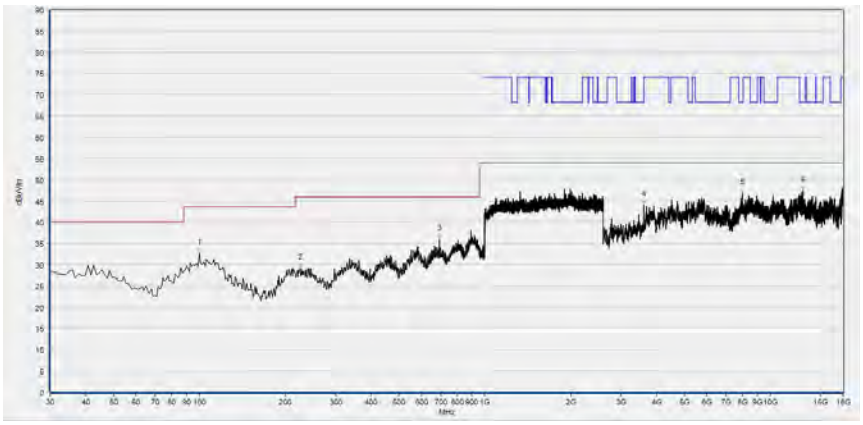
(Antenna Horizontal, 30MHz to 18GHz)



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
103.720	32.15	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
245.340	30.89	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
665.350	35.01	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
5261.120	47.83	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
7013.640	52.48	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12160.320	47.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

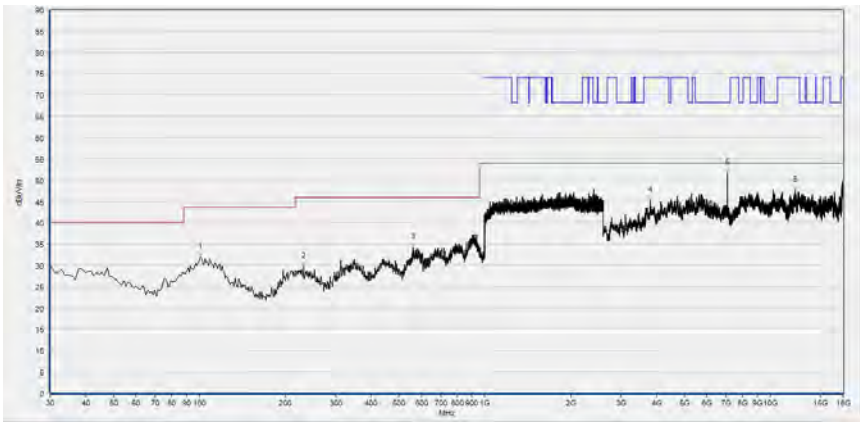
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 60



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
99.840	32.63	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
224.970	29.11	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
692.510	36.00	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
3601.000	44.11	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7993.080	46.89	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12998.080	47.39	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS

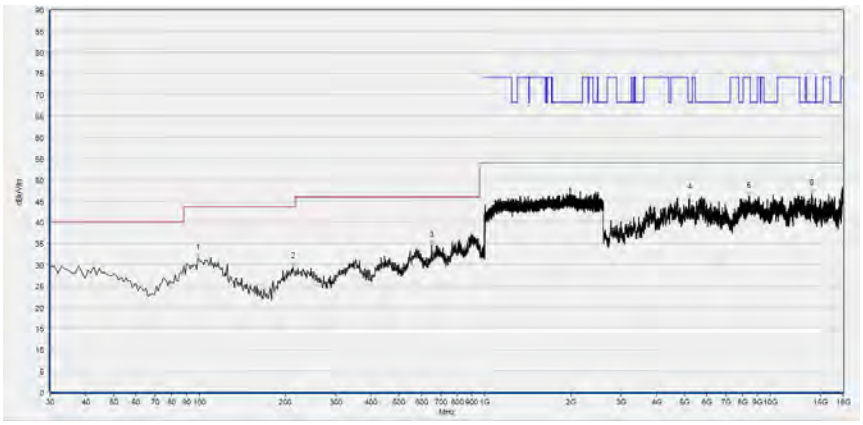
(Antenna Horizontal, 30MHz to 18GHz)



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
100.810	32.02	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
231.760	29.59	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
559.620	34.27	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
3801.200	45.31	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7066.000	51.63	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12218.840	47.52	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

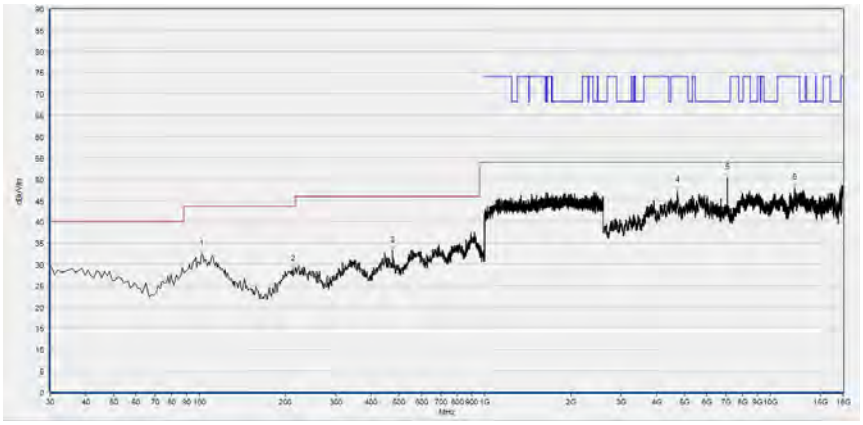
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 64



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
98.870	31.52	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
212.360	29.52	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
651.770	34.56	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
5205.680	45.83	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
8418.120	46.05	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
13962.120	46.74	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS

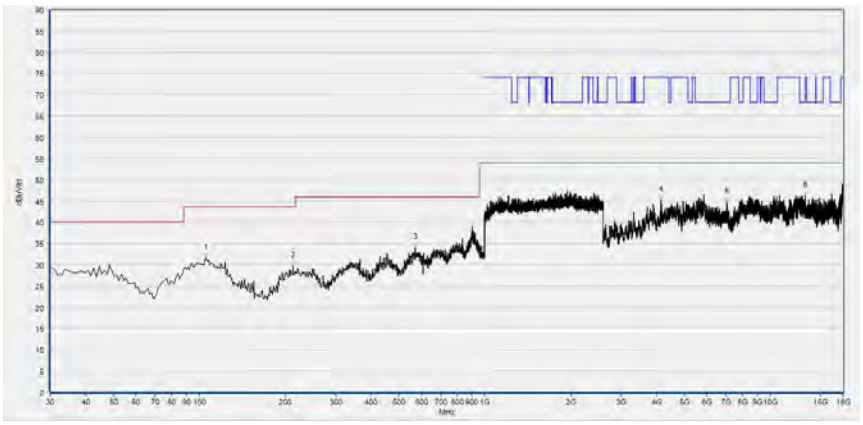
(Antenna Horizontal, 30MHz to 18GHz)



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
101.780	32.30	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
212.360	28.80	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
475.230	33.22	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
4725.200	47.18	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7093.720	50.32	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12157.240	47.92	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

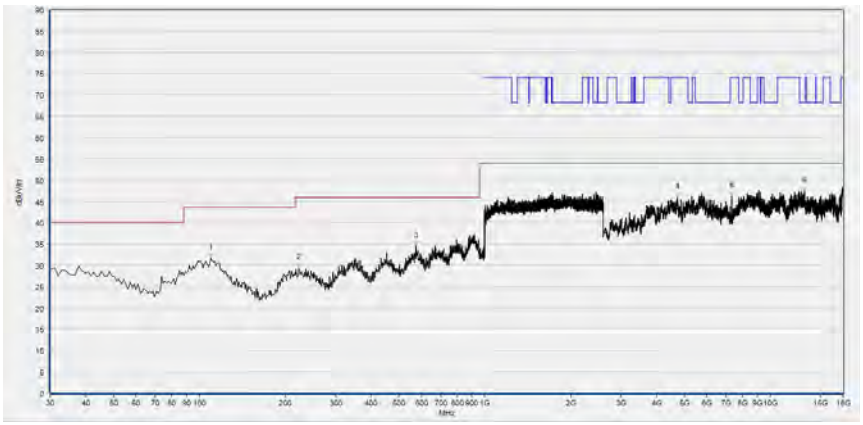
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 100



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
105.660	31.48	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
213.330	29.70	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
570.290	33.96	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
4146.160	45.23	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7044.440	44.73	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
13256.800	46.30	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

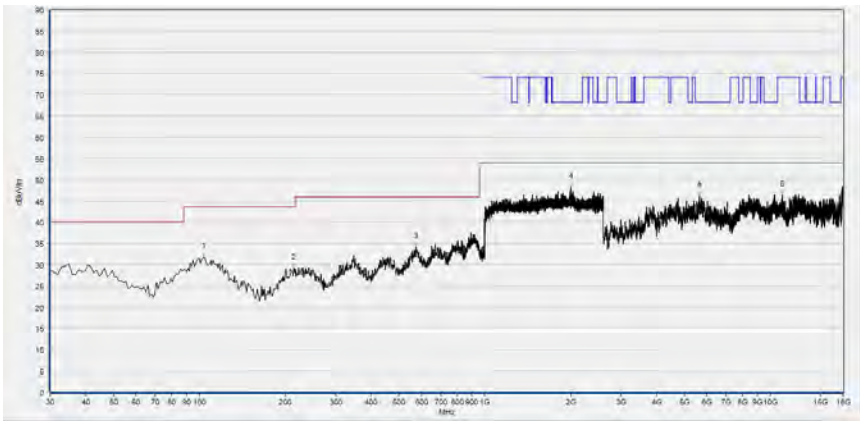
(Antenna Horizontal, 30MHz to 18GHz)



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
109.540	31.67	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
223.030	29.32	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
574.170	34.53	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
4719.040	45.85	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7333.960	46.19	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13219.840	47.36	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

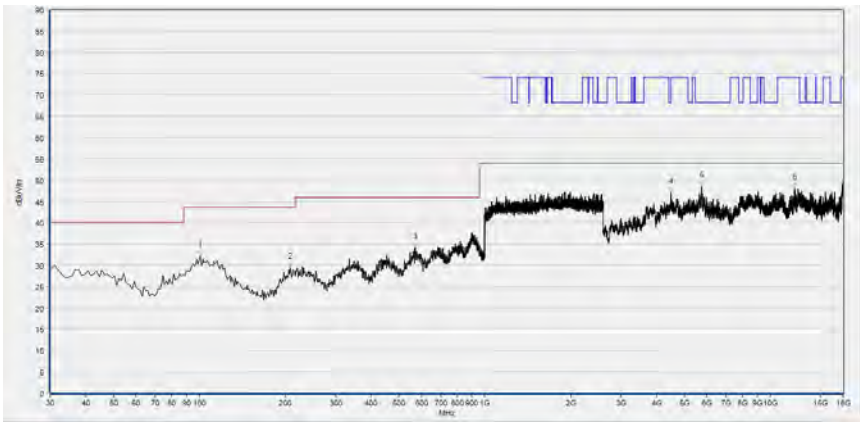
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 120



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
103.720	31.83	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
214.300	29.21	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
575.140	34.12	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1997.333	48.24	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
5649.200	46.21	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
10999.160	46.34	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

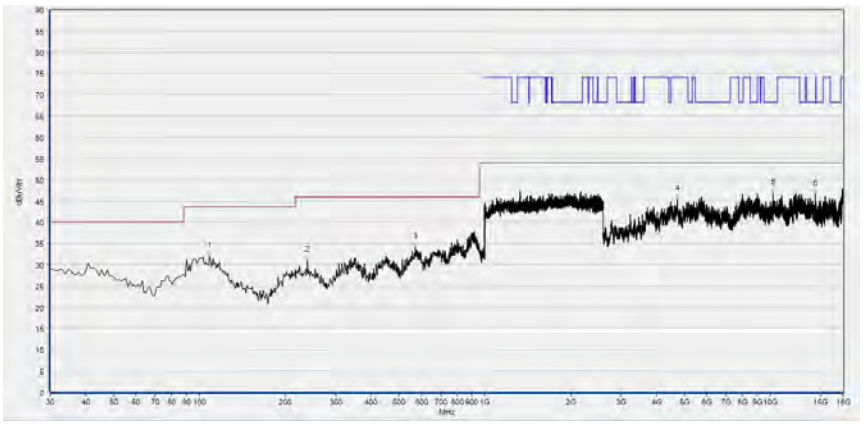
(Antenna Horizontal, 30MHz to 18GHz)



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
100.810	32.26	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
208.480	29.47	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
571.260	34.12	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
4478.800	47.04	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
5757.000	48.57	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12138.760	48.11	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

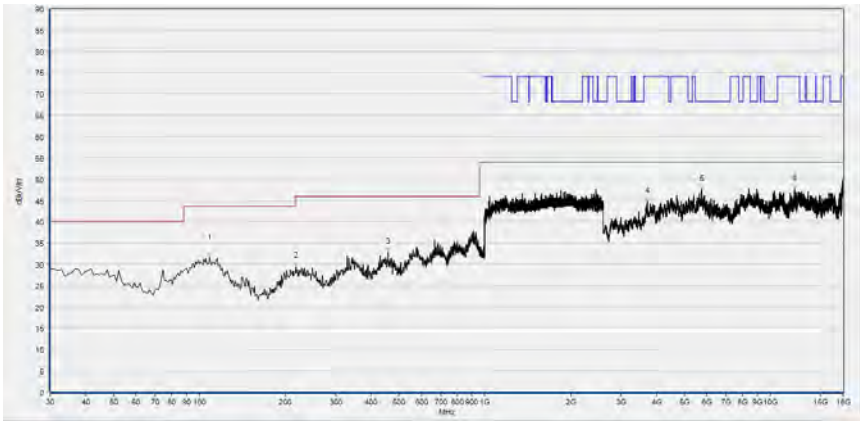
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 144



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
108.570	31.95	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
239.520	30.97	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
571.260	34.21	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
4715.960	45.49	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10219.920	46.98	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
14414.880	46.61	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS

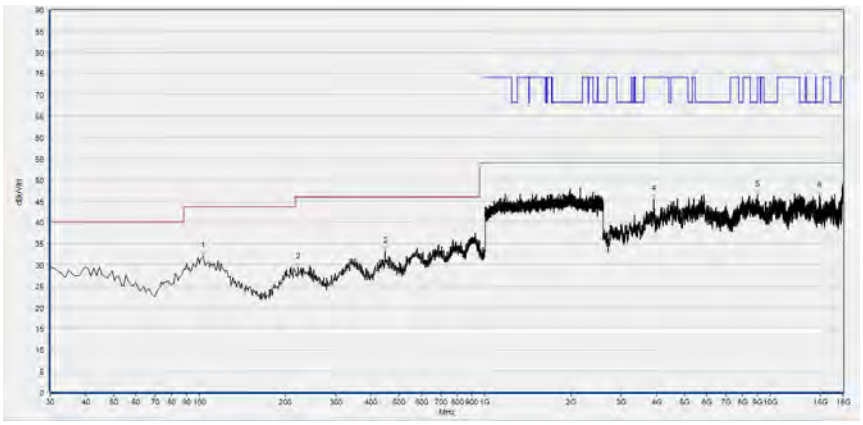
(Antenna Horizontal, 30MHz to 18GHz)



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
108.570	31.59	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
217.210	29.43	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
458.740	32.90	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
3711.880	44.77	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5747.760	47.67	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12184.960	47.78	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

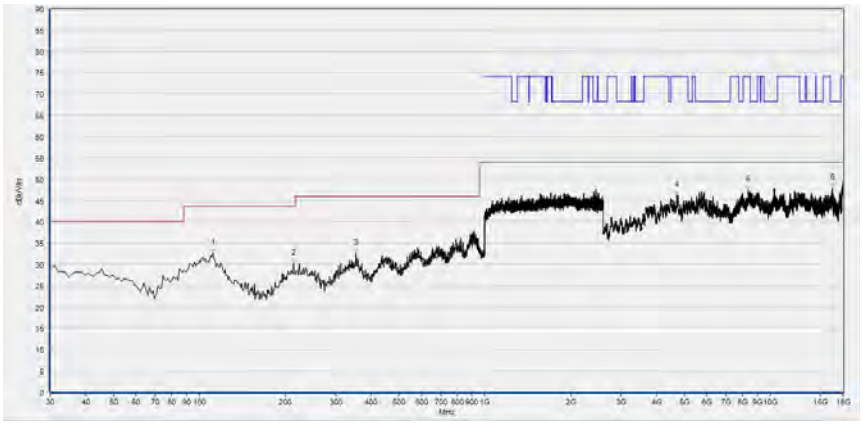
(Antenna Vertical, 30MHz to 18GHz)

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
102.750	32.04	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
222.060	29.40	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
447.100	33.14	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
3915.160	45.39	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9006.400	46.35	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14892.280	46.32	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS

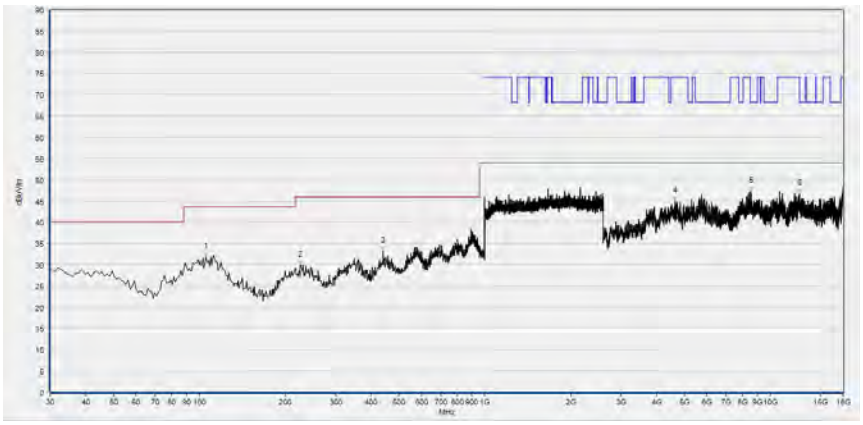
(Antenna Horizontal, 30MHz to 18GHz)



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
111.480	32.52	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
214.300	30.14	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
353.010	32.57	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
4712.880	46.21	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8387.320	47.45	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
16552.400	47.88	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

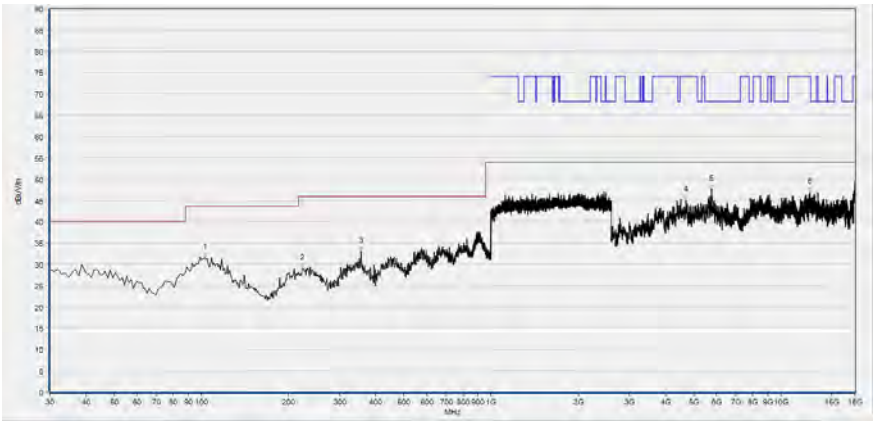
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 157



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
105.660	31.85	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
225.940	29.79	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
440.310	33.14	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
4642.040	44.84	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8575.200	47.27	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12671.600	46.72	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

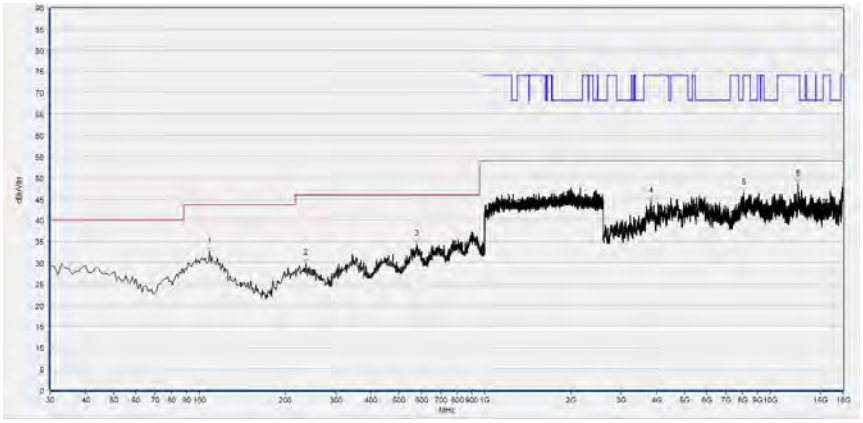
(Antenna Horizontal, 30MHz to 18GHz)



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
102.750	31.47	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
223.030	29.02	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
355.920	33.06	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
4712.880	45.08	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5766.240	47.61	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12591.520	46.89	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

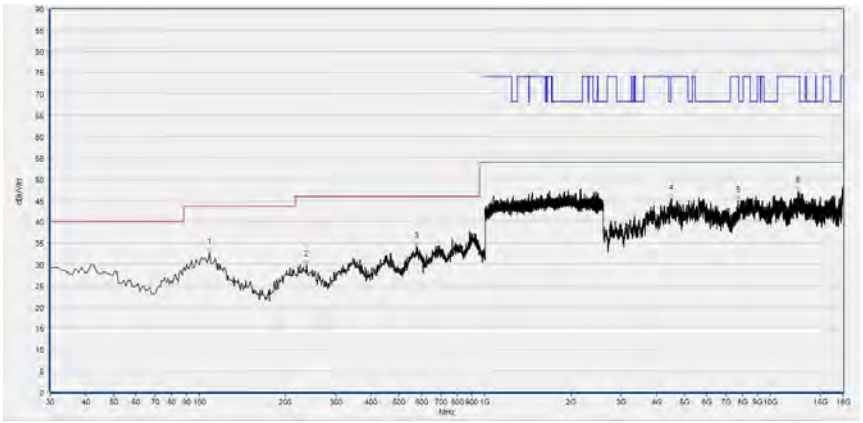
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 165



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
108.570	32.52	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
236.610	29.80	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
578.050	34.29	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
3816.600	44.33	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8094.720	46.51	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12514.520	48.46	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

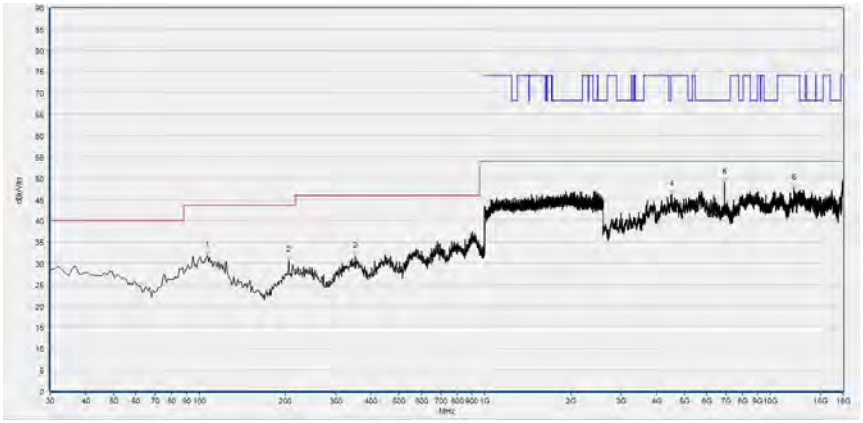


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
108.570	32.75	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
237.580	29.76	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
576.110	34.18	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
4478.800	45.38	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
7718.960	44.86	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12508.360	47.17	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

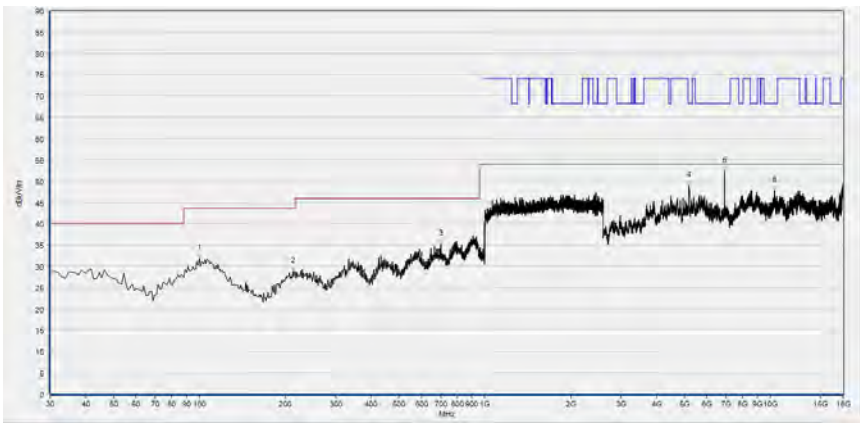
802.11n (HT40) mode

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
106.630	31.82	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
205.570	30.64	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
352.040	31.61	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
4518.840	46.30	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
6921.240	48.87	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12074.080	47.52	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

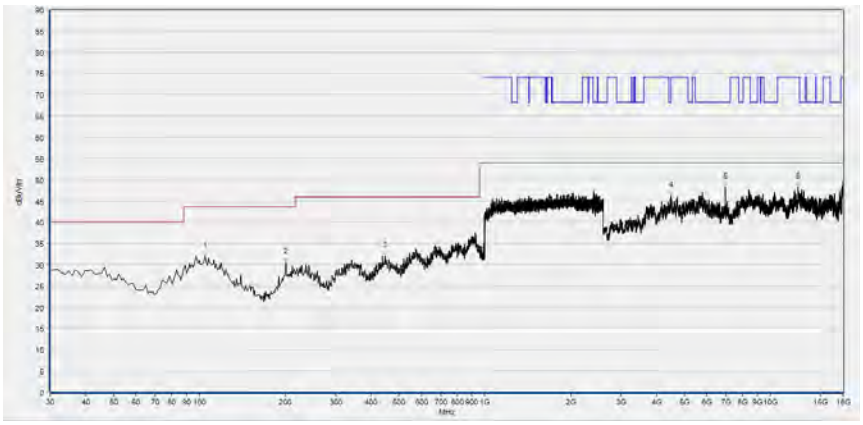
(Antenna Horizontal, 30MHz to 18GHz)



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
99.840	31.92	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
212.360	28.84	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
700.270	35.24	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
5193.360	48.90	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
6921.240	52.29	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
10361.600	47.78	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

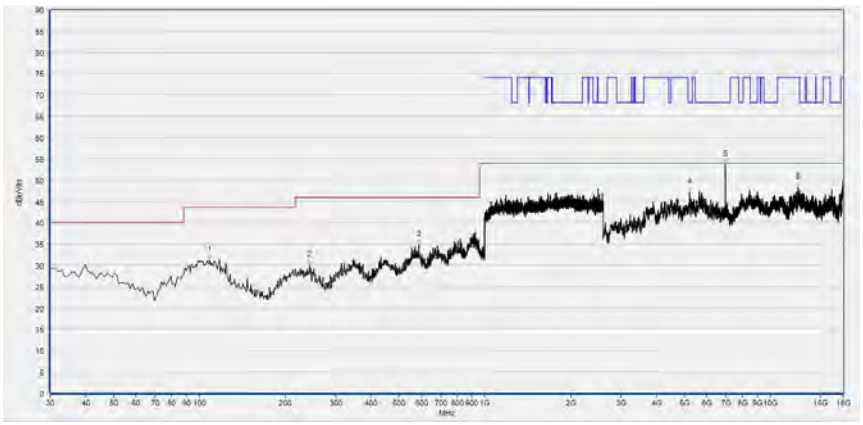
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 46



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
104.690	31.96	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
200.720	30.50	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
447.100	32.09	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
4481.880	46.21	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
6973.600	48.25	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12529.920	48.19	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

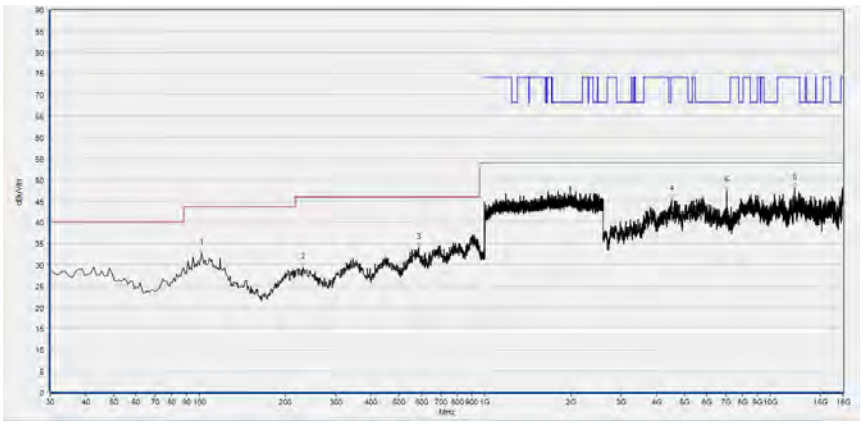
(Antenna Horizontal, 30MHz to 18GHz)



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
108.570	31.13	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
243.400	29.94	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
587.750	34.82	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
5214.920	47.04	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
6973.600	53.65	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12526.840	48.21	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

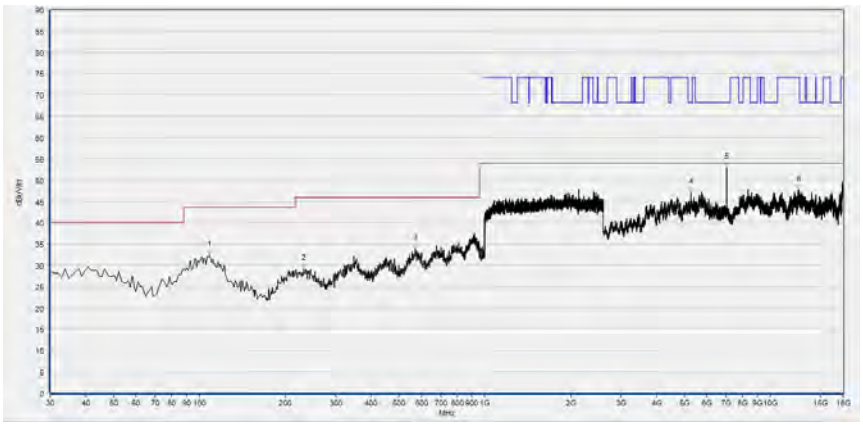
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 54



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
101.780	32.62	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
230.790	29.29	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
585.810	33.96	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
4512.680	45.45	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7025.960	47.39	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12141.840	48.04	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

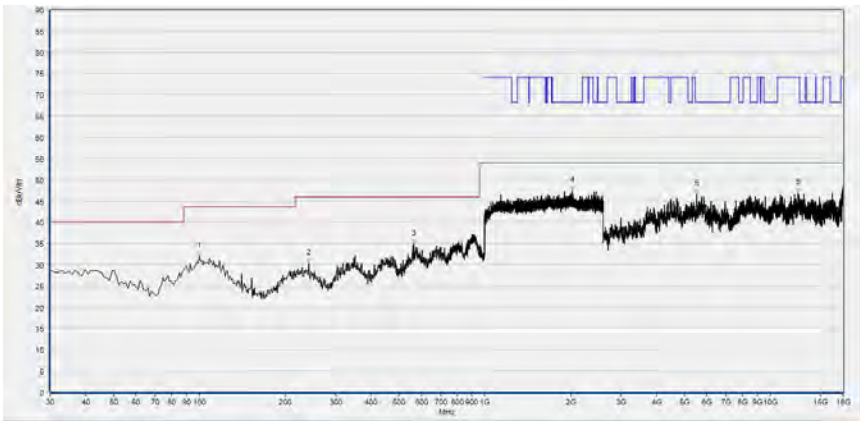
(Antenna Horizontal, 30MHz to 18GHz)



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
108.570	32.38	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
232.730	29.15	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
571.260	33.90	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
5273.440	47.06	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
7025.960	52.89	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12600.760	47.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

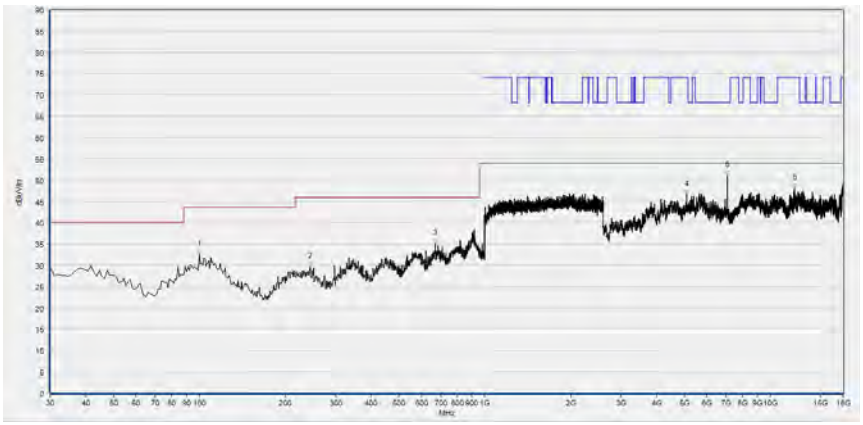
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 62



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
99.840	32.01	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
241.460	30.38	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
563.500	34.86	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2028.267	47.42	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
5538.320	46.55	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12520.680	46.87	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

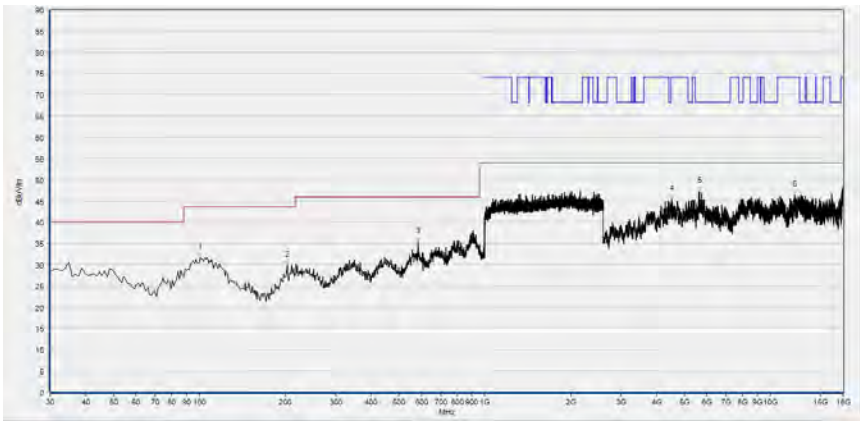
(Antenna Horizontal, 30MHz to 18GHz)



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
99.840	32.58	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
244.370	29.63	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
671.170	35.01	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
5085.560	46.56	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7078.320	51.16	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12163.400	48.11	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

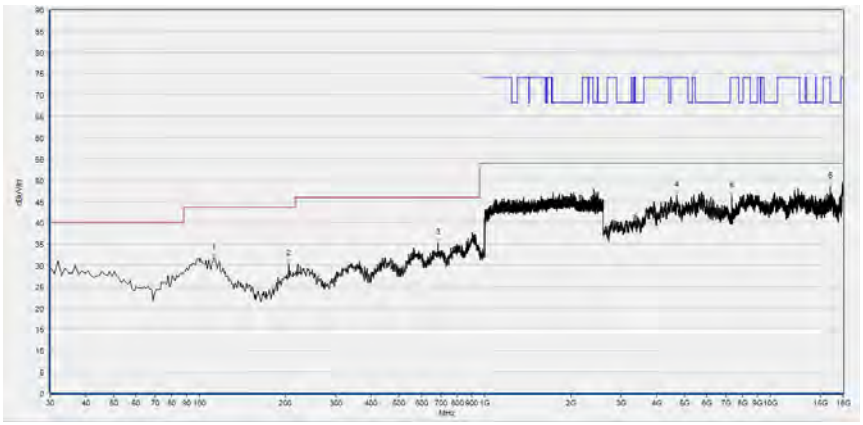
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 102



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
100.810	31.70	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
203.630	29.77	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
581.930	35.37	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
4509.600	45.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5643.040	47.30	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12194.200	46.46	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

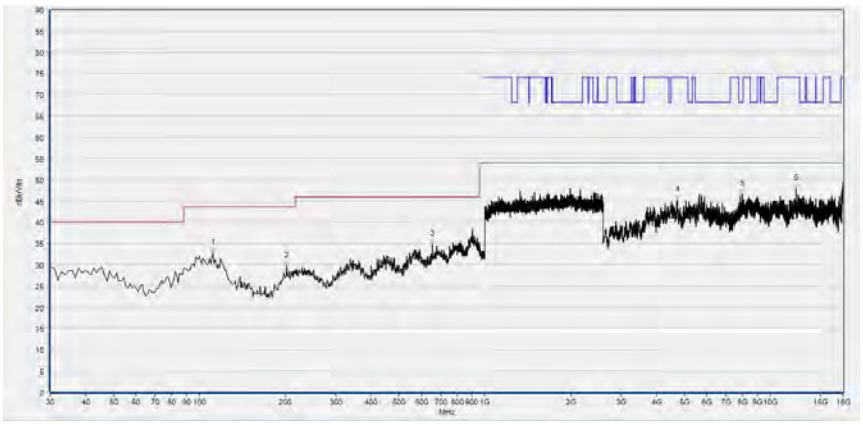
(Antenna Horizontal, 30MHz to 18GHz)



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
112.450	31.74	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
205.570	30.40	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
683.780	35.22	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
4712.880	46.41	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7346.280	46.33	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
16204.360	48.37	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

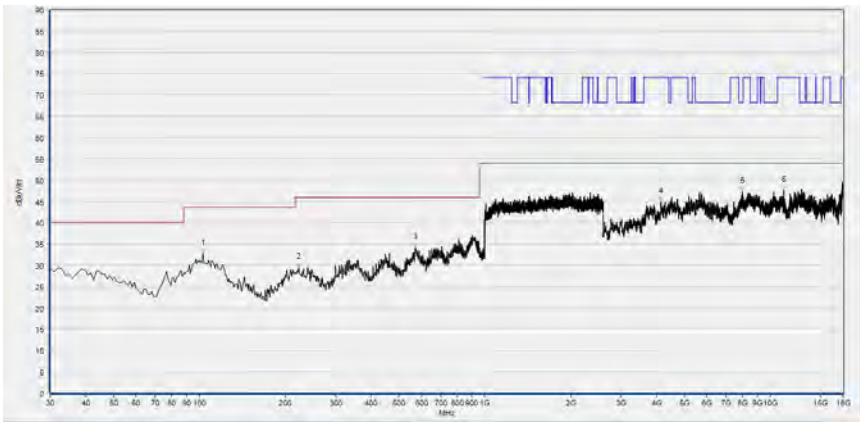
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 126



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
111.480	32.63	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
201.690	29.63	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
655.650	34.88	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
4734.440	45.34	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7977.680	46.59	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12302.000	47.99	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

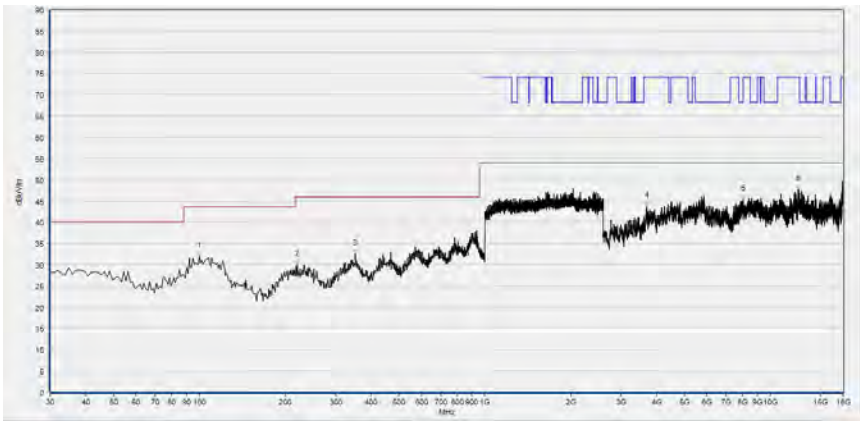
(Antenna Horizontal, 30MHz to 18GHz)



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
102.750	32.61	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
223.030	29.48	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
571.260	34.20	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
4152.320	44.98	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7983.840	47.21	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
11137.760	47.58	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

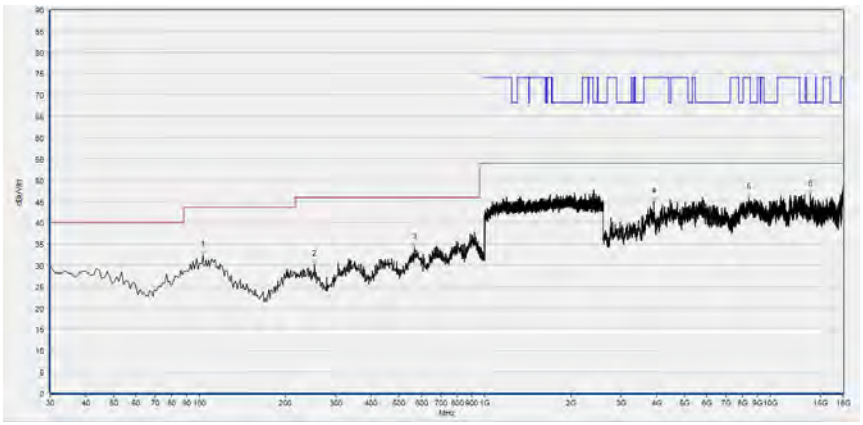
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 142



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
99.840	31.94	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
220.120	29.96	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
352.040	32.56	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
3684.160	43.78	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8048.520	45.42	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12508.360	47.73	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

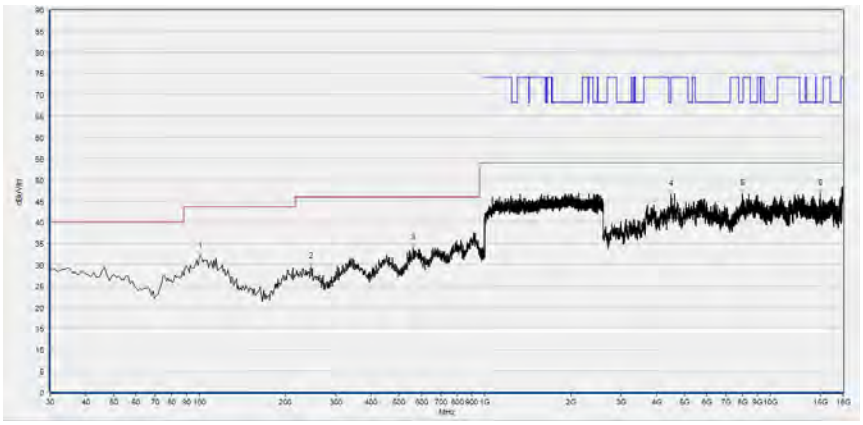
(Antenna Horizontal, 30MHz to 18GHz)



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
102.750	32.30	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
253.100	30.19	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
566.410	34.20	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
3909.000	44.96	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8421.200	45.93	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13845.080	46.51	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

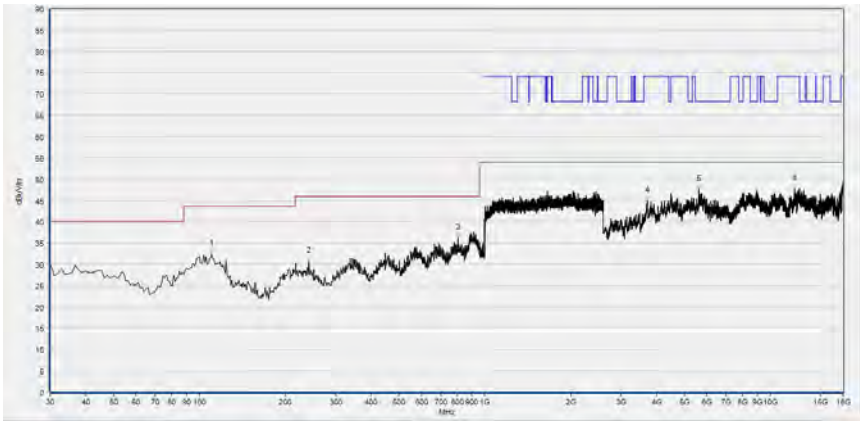
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 151



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
100.810	32.00	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
245.340	29.44	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
560.590	33.78	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
4481.880	46.53	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
7971.520	46.74	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
15006.240	46.72	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS

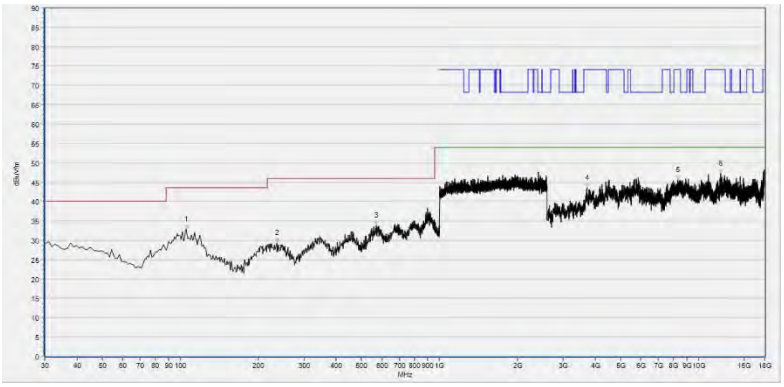
(Antenna Horizontal, 30MHz to 18GHz)



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
110.510	32.28	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
241.460	30.62	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
804.060	36.17	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
3711.880	44.89	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5618.400	47.67	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12194.200	47.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

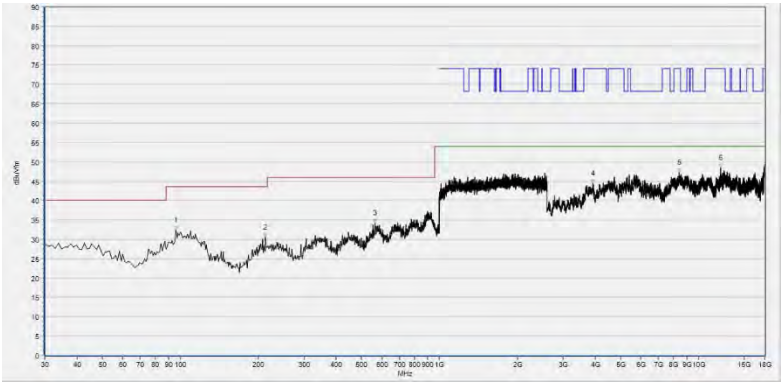
(Antenna Vertical, 30MHz to 18GHz)

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
105.660	32.88	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
235.640	29.25	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
570.290	33.80	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
3702.640	43.60	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8319.560	45.54	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12160.320	47.26	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
95.960	32.27	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
213.330	30.42	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
564.470	34.24	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
3912.080	44.45	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8424.280	47.18	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12188.040	48.38	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

END OF REPORT