



REPORT No.: SZ24110315W02

TEST REPORT

APPLICANT : Anker Innovations Limited

PRODUCT NAME : NEBULA X1

MODEL NAME : D2351

BRAND NAME : NEBULA

FCC ID : 2AOKB-D2351

STANDARD(S) : 47 CFR Part 15 Subpart E

RECEIPT DATE : 2024-12-11

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Edited by:

Su Xiaoxian

Su Xiaoxian (Rapporteur)

Approved by:

Shen Junsheng

Shen Junsheng (Supervisor)

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MORLAB

Shenzhen Morlab Communications Technology Co., Ltd.
FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen, Guangdong Province, P. R. China

Tel: 86-755-36698555

Http://www.morlab.cn

Fax: 86-755-36698525

E-mail: service@morlab.cn





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Change History		
Version	Date	Reason for change
1.0	2025-01-24	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	Jan. 08, 2025	Li Zikai	PASS	No deviation
3	15.407(a)	Maximum Conducted Output Power	Jan. 08, 2025	Li Zikai	PASS	No deviation
4	15.407(a)(e)	Emission Bandwidth	Jan. 08, 2025	Li Zikai	PASS	No deviation
5	15.407(a)	Peak Power Spectral Density	Jan. 08, 2025	Li Zikai	PASS	No deviation
6	15.407(g)	Frequency Stability	Jan. 08, 2025	Li Zikai	PASS	No deviation
7	15.407(h)	DFS	Jan. 08, 2025	Li Zikai	PASS	No deviation
8	15.207	Conducted Emission	Dec. 28, 2024	Fan Shengquan	PASS	No deviation
9	15.407(b)	Restricted Frequency Bands	Jan. 9, 2025	Gao Jianrou	PASS	No deviation
10	15.407(b)	Radiated Emission	Jan. 08&9, 2025	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 KDB 789033 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 Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
EXA Signal Analyzer	MY53470836	N9010A	Agilent	2024.02.19	2025.02.18
USB Wideband Power Sensor	MY54180008	U2021XA	Agilent	2024.09.11	2025.09.10
Temperature Chamber	12108015	DTL-003S101	YOMA	2024.09.11	2025.09.10
RF Cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
SMA Connector	CN01	RF03	HUBER-SUHNER	N/A	N/A
Attenuator	MTJ6004-10	10dB	MTJ cooperation	N/A	N/A

1.2.2 Conducted Emission Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY56400093	N9038A	KEYSIGHT	2024.01.25	2025.01.24
LISN	8127449	NSLK 8127	Schwarzbeck	2024.02.02	2025.02.01
Pulse Limiter (10dB)	VTSD 9561 F-B #206	VTSD 9561-F	Schwarzbeck	2024.05.30	2025.05.29
RF Coaxial Cable (DC-100MHz)	BNC	MRE04	Qualwave	2024.07.02	2025.07.01

1.2.3 List of Software Used

Description	Manufacturer	Software Version
Test System	MaiWei	V2.0.0.0
TS+ -[JS36-RSE]	Tonscend	V3.0.0.0
TS+ -[JS32-CE]	Tonscend	V2.5.0.0
TS+	Tonscend	V5.0.0

**1.2.4 Radiated Test Equipment**

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Signal Analyzer	MY56060145	N9020A	Agilent	2024.05.30	2025.05.29
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2024.06.22	2025.06.21
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2024.06.03	2025.06.02
Test Antenna – Horn	01774	BBHA 9120D	Schwarzbeck	2024.06.22	2025.06.21
Test Antenna – Horn	BBHA9170 #773	BBHA9170	Schwarzbeck	2024.06.22	2025.06.21
Preamplifier (10MHz-6GHz)	46732	S10M100L38 02	LUCIX CORP.	2024.05.30	2025.05.29
Preamplifier (2GHz-18GHz)	61171/61172	S020180L32 03	LUCIX CORP.	2024.05.30	2025.05.29
Preamplifier (18GHz-40GHz)	DS77209	DCLNA0118-40C-S	Decentest	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE001	PE330	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE002	CLU18	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE003	CLU18	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-40GHz)	22290045	QA360-40-KK-0.5	Qualwave	2024.07.03	2025.07.02
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40-KKF-2	Qualwave	2024.07.03	2025.07.02
RF Coaxial Cable (DC-18GHz)	22120181	QA500-18-NN-5	Qualwave	2024.07.03	2025.07.02
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.05.10	2025.05.09



1.3. Measurement Uncertainty

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

1.4. Testing Laboratory

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

2. General Description

2.1. Information of Applicant and Manufacturer

Applicant:	Anker Innovations Limited
Applicant Address:	Unit 56, 8th Floor, Tower 2, Admiralty Centre, 18 Harcourt Road, Hong Kong
Manufacturer:	Anker Innovations Limited
Manufacturer Address:	Unit 56, 8th Floor, Tower 2, Admiralty Centre, 18 Harcourt Road, Hong Kong

2.2. Information of EUT

Product Name:	NEBULA X1	
Sample No.:	1#, 2#, 3#	
Hardware Version:	V03	
Software Version:	V11.0.18.7	
Modulation Technology:	OFDM	
Modulation Mode:	802.11a, 802.11n (HT20), 802.11n (HT40)	
Operating Frequency Range:	5180MHz-5240MHz; 5260MHz-5320MHz; 5500MHz-5720MHz; 5745MHz-5825MHz	
DFS Function:	☒ Slave without radar detection ☐ Slave with radar detection ☐ Master	
Antenna Type:	Dipole Antenna	
Antenna Gain:	4.3dBi	
Accessory Information:	AC Adapter	
	Brand Name:	N/A
	Model No.:	NSA240EC-22010900
	Serial No.:	N/A
	Rated Output:	100-240V~ 50/60Hz, 2.5A
	Rated Input:	22.0V=10.9A
	Manufacturer:	Shenzhen JingQuanHua&Everrise Intelligent Electric Co., Ltd.

Note 1: 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
802.11a	20	OFDM	BPSK	6/9/12/18/24/36/48/54 Mbps
			QPSK	
			16QAM	
			64QAM	
802.11n	20/40 (HT20/40)	OFDM	BPSK	MCS0~MCS7
			QPSK	
			16QAM	
			64QAM	
802.11ac	20/40 (VHT20/40)	OFDM	BPSK	MCS0~MCS9
			QPSK	
			16QAM	
			64QAM	
			256QAM	

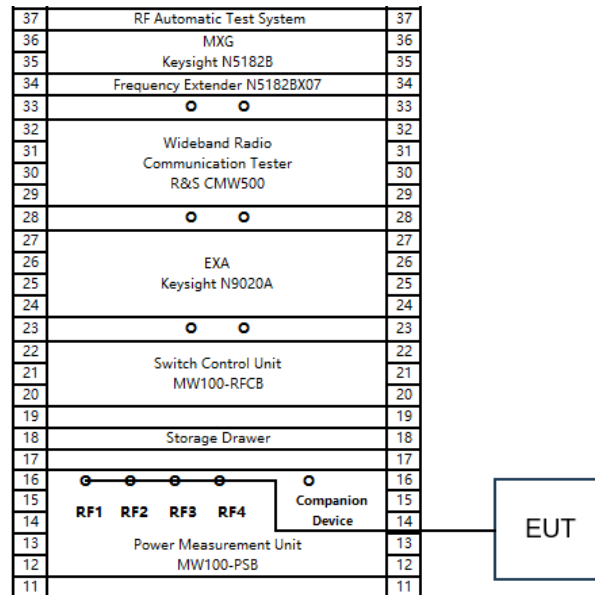
Note1: The worst-case mode (bold face) in all data rates has been determined during the pre-scan, only the test data of the worst-case were recorded in this report.

2.5. Test Conditions

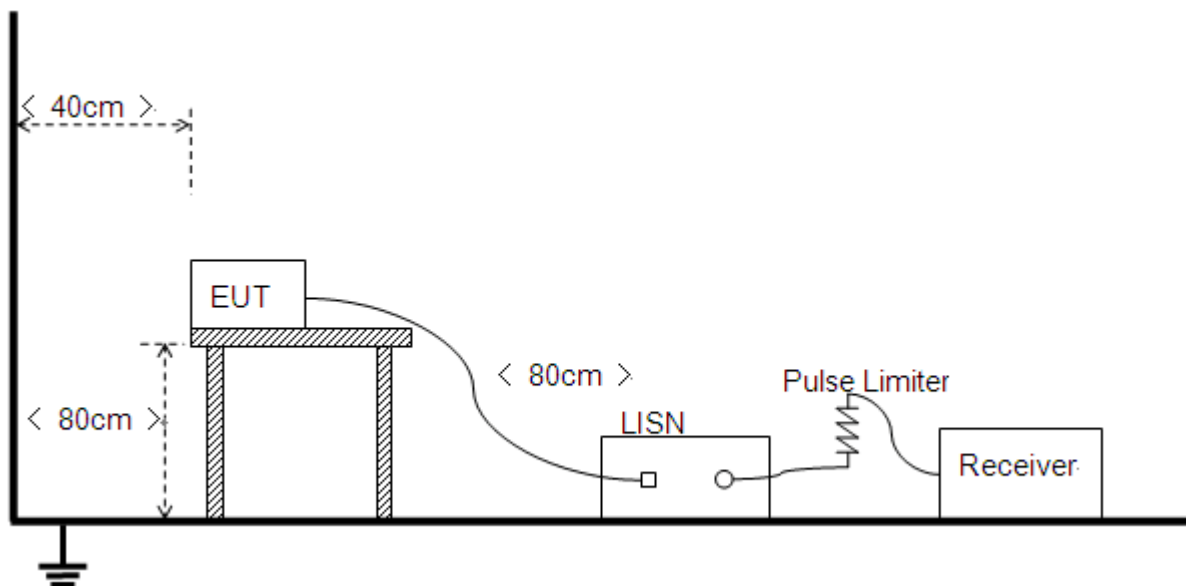
Temperature (°C):	15-35
Relative Humidity (%):	30-60
Atmospheric Pressure (kPa):	86-106

2.6. Test Setup Layout Diagram

2.6.1. Conducted Measurement

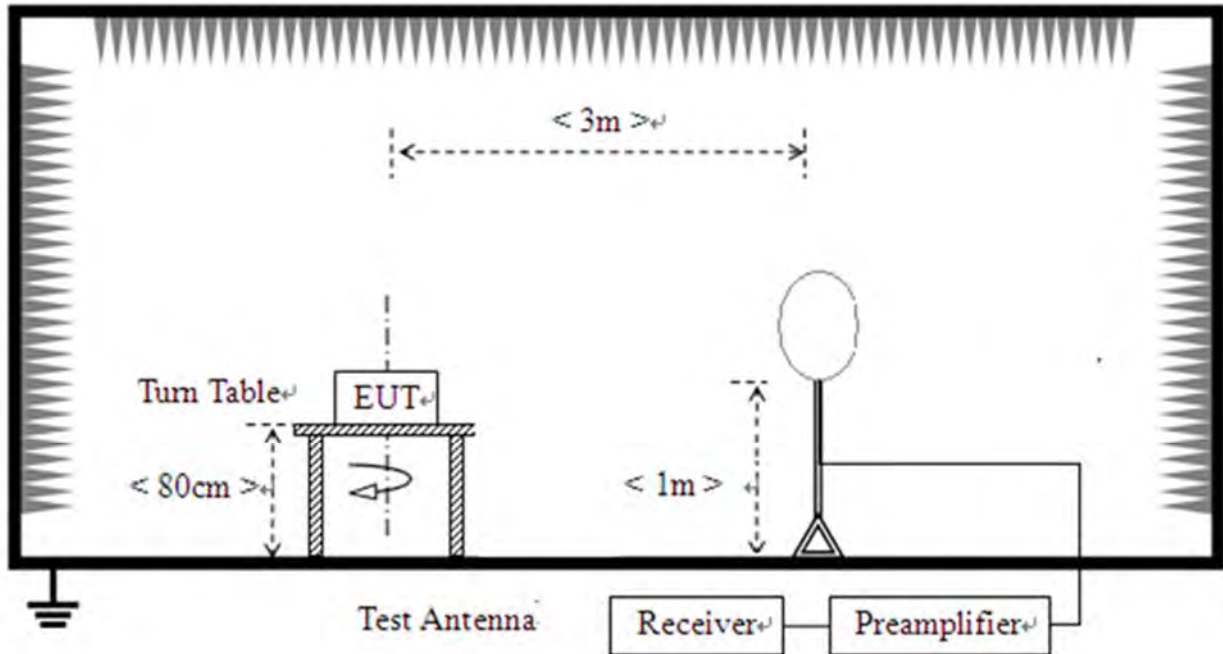


2.6.2. Conducted Emission Measurement

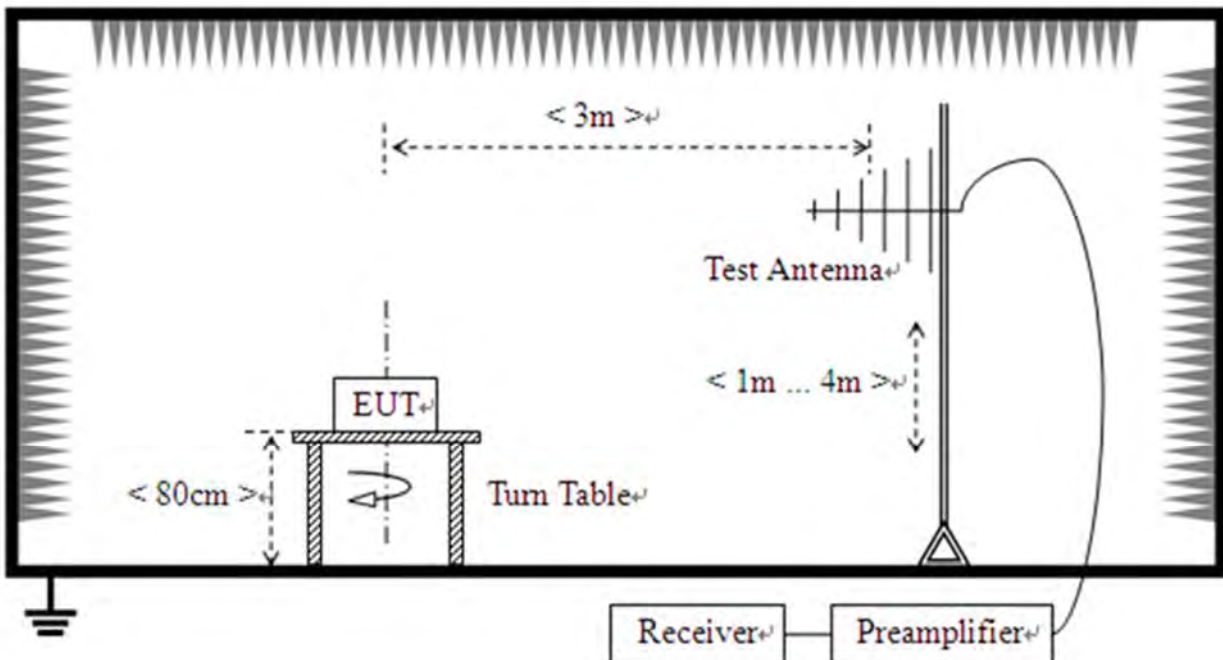


2.6.3.Radiation Measurement

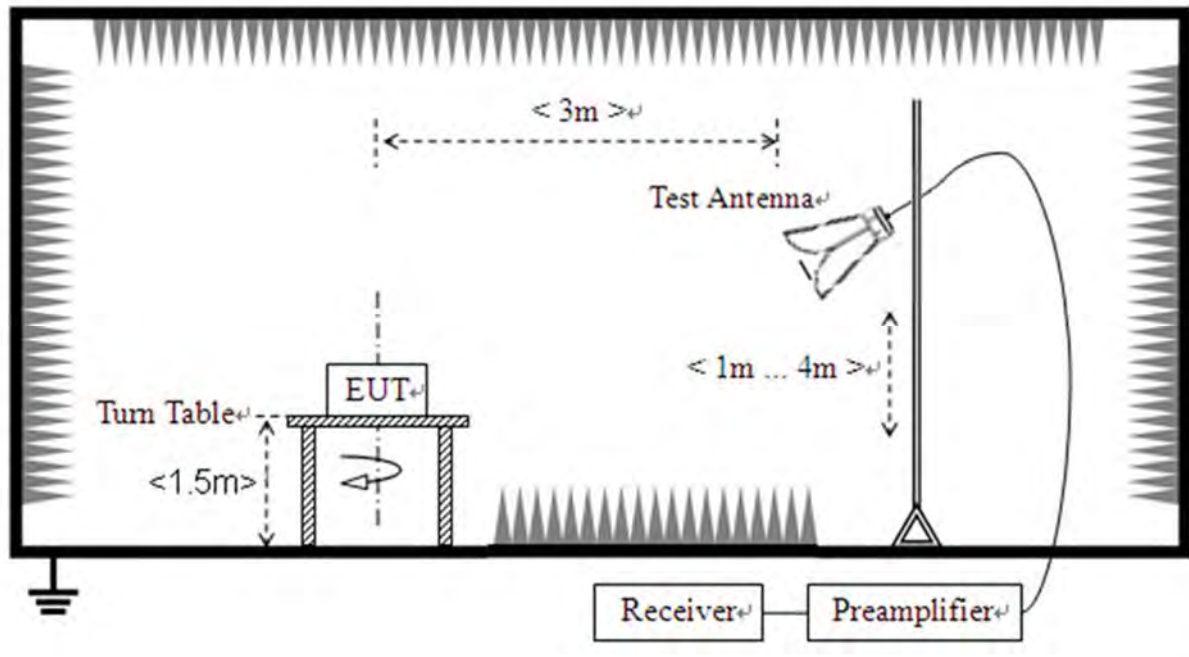
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz





3. Test Results

3.1. Antenna Requirement

3.1.1. Requirement

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.1.2. Test Result

Antenna location	Antenna Type	Coupling Method
☒ Internal ☐ External	☐ FPC Antenna ☐ Spring Antenna ☐ Ceramic Antenna ☐ Integrated Antenna ☒ Dipole Antenna ☐ PCB Antenna ☐ PIFA Antenna ☐ On-board Antenna	☒ I-PEX Connector ☐ SMA Connector ☐ RP-SMA Connector ☐ Metal Shrapnel ☐ Layout



3.2. Duty Cycle of Test Signal

3.2.1. Requirement

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

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

3.2.2. Test Result

Refer to Annex A.1 in this report.



3.3. Maximum Conducted Output Power

3.3.1. Requirement

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

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

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

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

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

3.3.2. Test Procedures

Based on method PM-G in Section II.E.3.b) of KDB 789033 D02.

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 the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

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



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3.4.2.Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.4.3.Test Result

Refer to Annex A.3 in this report.



3.5. Peak Power Spectral Density

3.5.1. Requirement

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

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

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

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

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

3.5.2. Test Procedures

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

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

Record the max value

3.5.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.5.4. Test Result

Refer to Annex A.4 in this report.



3.6. Frequency Stability

3.6.1. Requirement

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

3.6.2. Test Procedures

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

3.6.3. Test Result

Refer to Annex A.5 in this report.

3.7. 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

- 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.
- 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.
- 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.
- 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).
- 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.
- 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 $\geq$ 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.

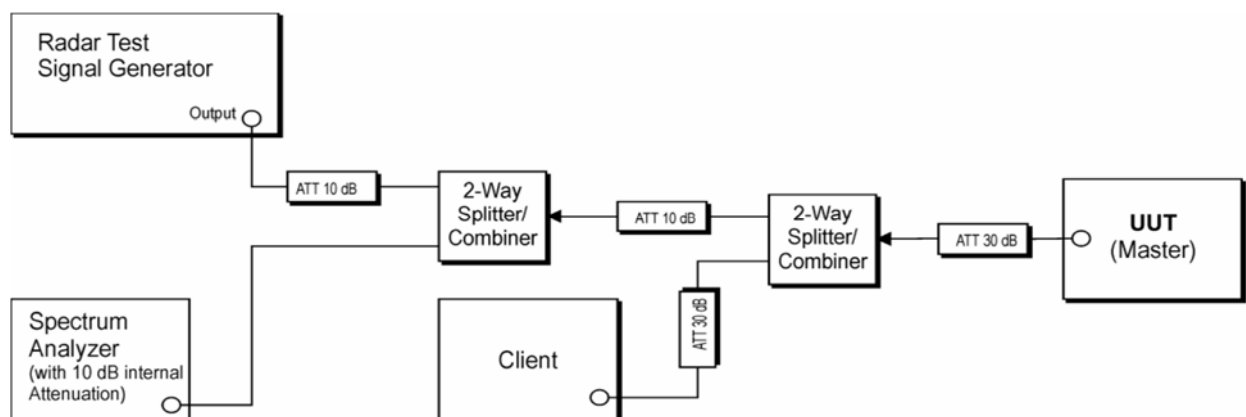
Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The 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

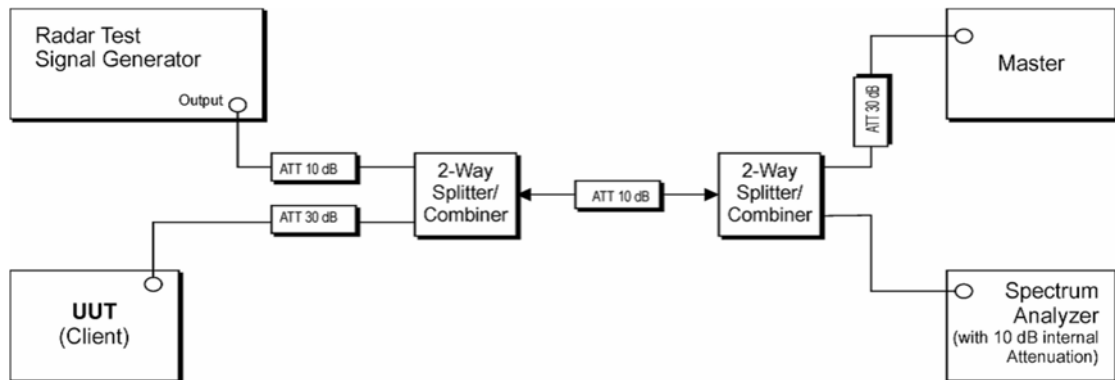
According to Section 7.2 of KDB 905462 D02 V01R01

1. Setup for Master with injection at the Master



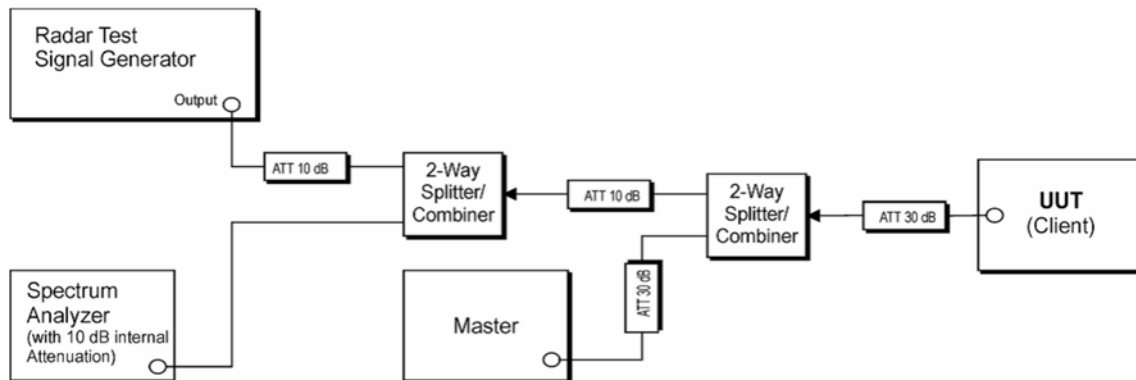
(Example Conducted Setup where UUT is a Master and Radar Test Waveforms are injected into the Master)

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 50 μ H/50 Ω line impedance stabilization network (LISN).

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

Note:

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

3.8.2. 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);

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

where P is the EIRP in Watts

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



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

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

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

3.9.2.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);

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

where P is the EIRP in Watts

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

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

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



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

3.10.2.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	Ant2	66.67	1.76	0.5
NVNT	a	5200	Ant2	66.89	1.75	0.5
NVNT	a	5240	Ant2	66.89	1.75	0.5
NVNT	a	5260	Ant2	67	1.74	0.49
NVNT	a	5300	Ant2	67	1.74	0.49
NVNT	a	5320	Ant2	67	1.74	0.49
NVNT	a	5500	Ant2	67	1.74	0.49
NVNT	a	5580	Ant2	67	1.74	0.49
NVNT	a	5720	Ant2	66.89	1.75	0.5
NVNT	a	5745	Ant2	66.89	1.75	0.5
NVNT	a	5785	Ant2	66.67	1.76	0.5
NVNT	a	5825	Ant2	66.89	1.75	0.5
NVNT	n20	5180	Ant2	65.4	1.84	0.53
NVNT	n20	5200	Ant2	65.4	1.84	0.53
NVNT	n20	5240	Ant2	65.4	1.84	0.53
NVNT	n20	5260	Ant2	65.17	1.86	0.53
NVNT	n20	5300	Ant2	65.4	1.84	0.53
NVNT	n20	5320	Ant2	65.4	1.84	0.53
NVNT	n20	5500	Ant2	65.4	1.84	0.53
NVNT	n20	5580	Ant2	65.4	1.84	0.53
NVNT	n20	5720	Ant2	65.4	1.84	0.53
NVNT	n20	5745	Ant2	65.4	1.84	0.53
NVNT	n20	5785	Ant2	65.4	1.84	0.53
NVNT	n20	5825	Ant2	65.05	1.87	0.53
NVNT	n40	5190	Ant2	48.19	3.17	1.08
NVNT	n40	5230	Ant2	47.67	3.22	1.09
NVNT	n40	5270	Ant2	48.19	3.17	1.08
NVNT	n40	5310	Ant2	48.19	3.17	1.08
NVNT	n40	5510	Ant2	48.19	3.17	1.08
NVNT	n40	5550	Ant2	47.67	3.22	1.09
NVNT	n40	5710	Ant2	47.67	3.22	1.09
NVNT	n40	5755	Ant2	48.19	3.17	1.08

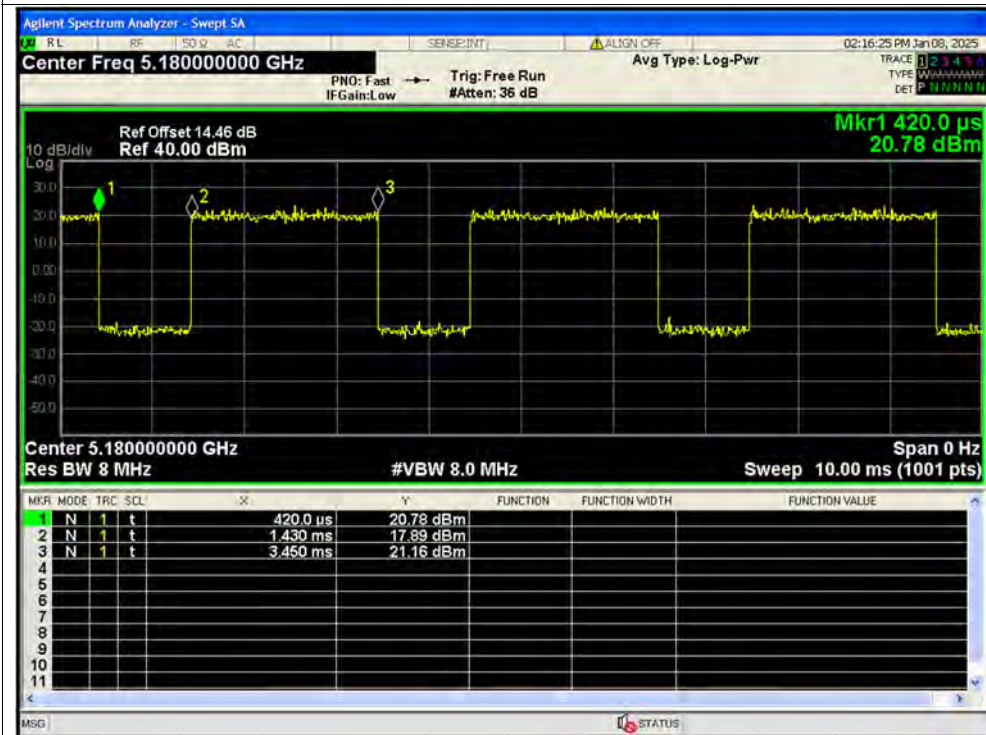


REPORT No.: SZ24110315W02

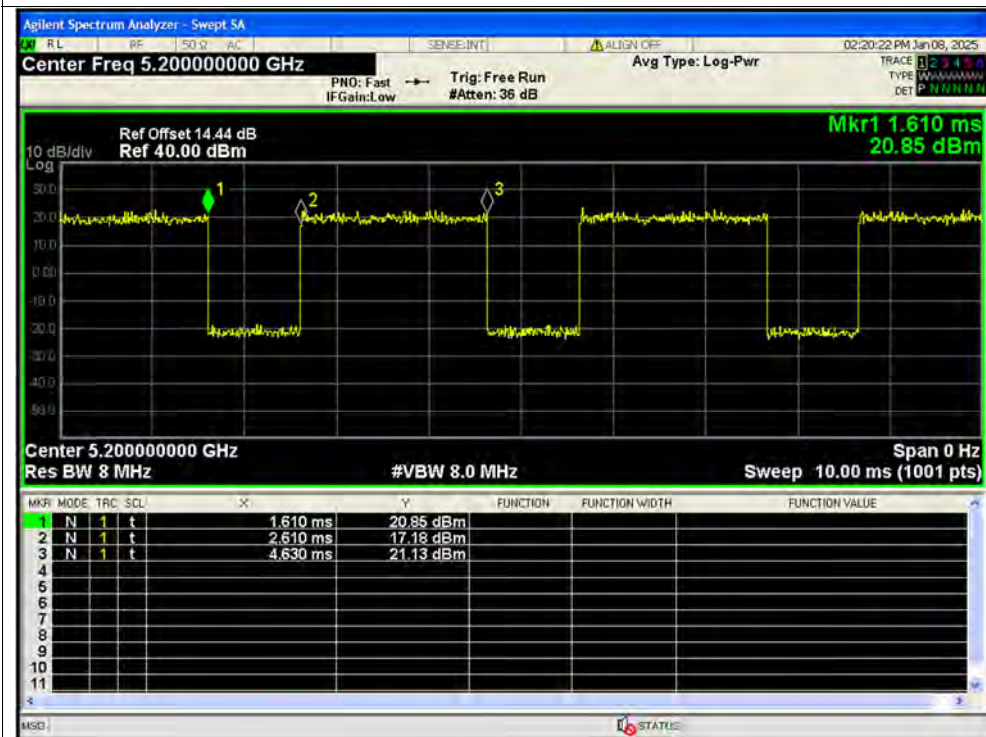
NVNT	n40	5795	Ant2	48.19	3.17	1.08
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Test Graphs

Duty Cycle NVNT a 5180MHz Ant2 SISO

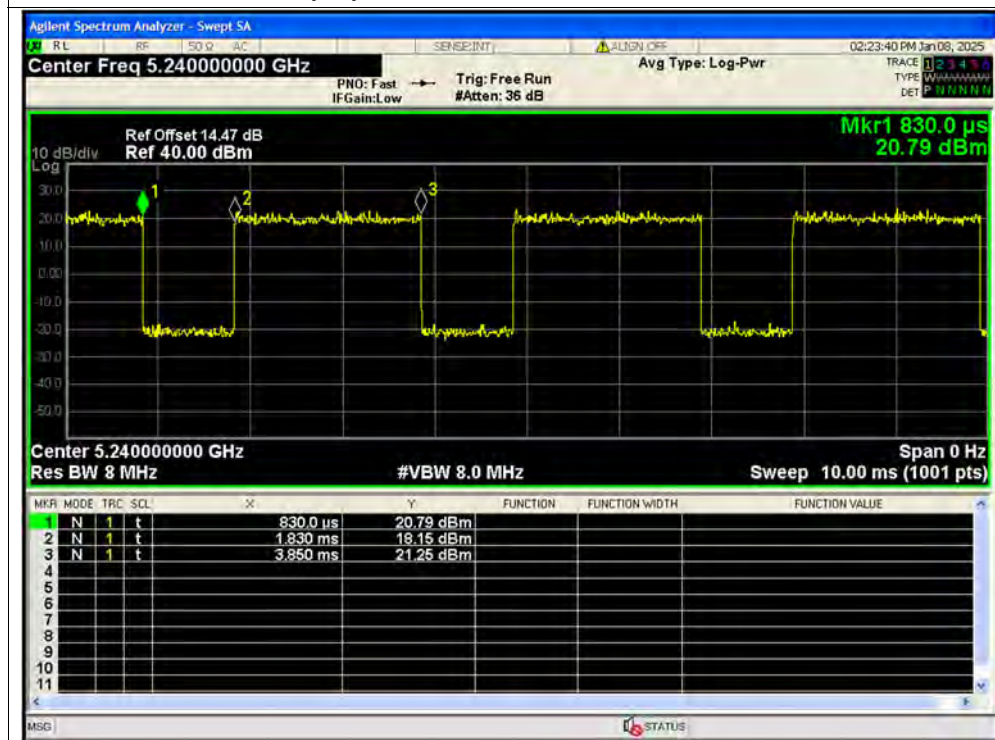


Duty Cycle NVNT a 5200MHz Ant2 SISO

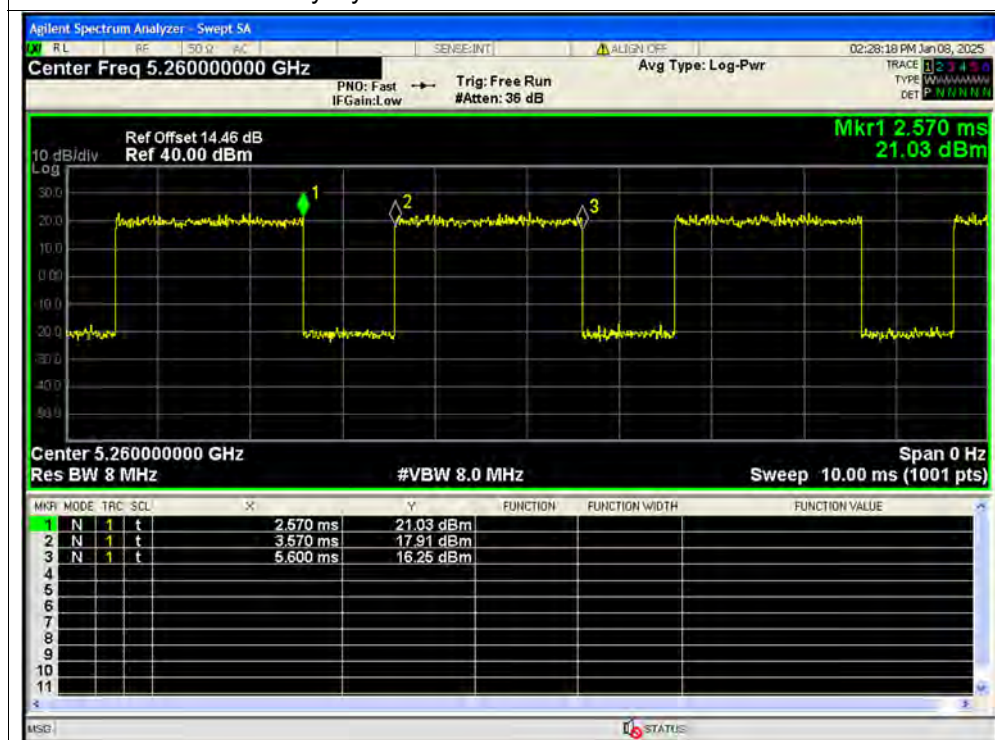




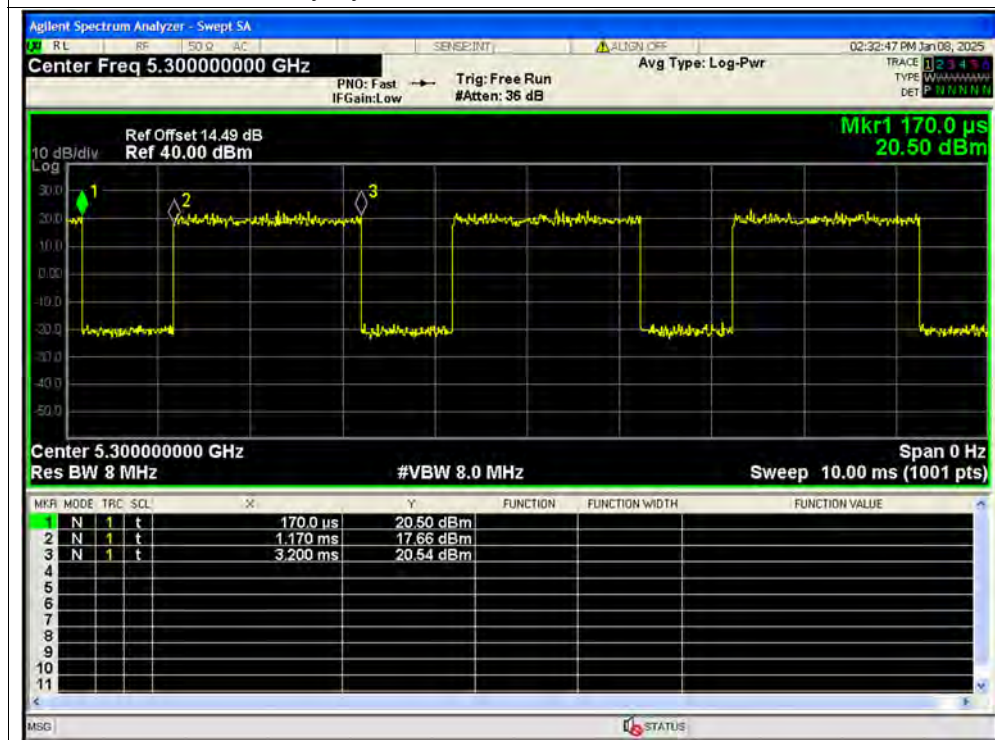
Duty Cycle NVNT a 5240MHz Ant2 SISO



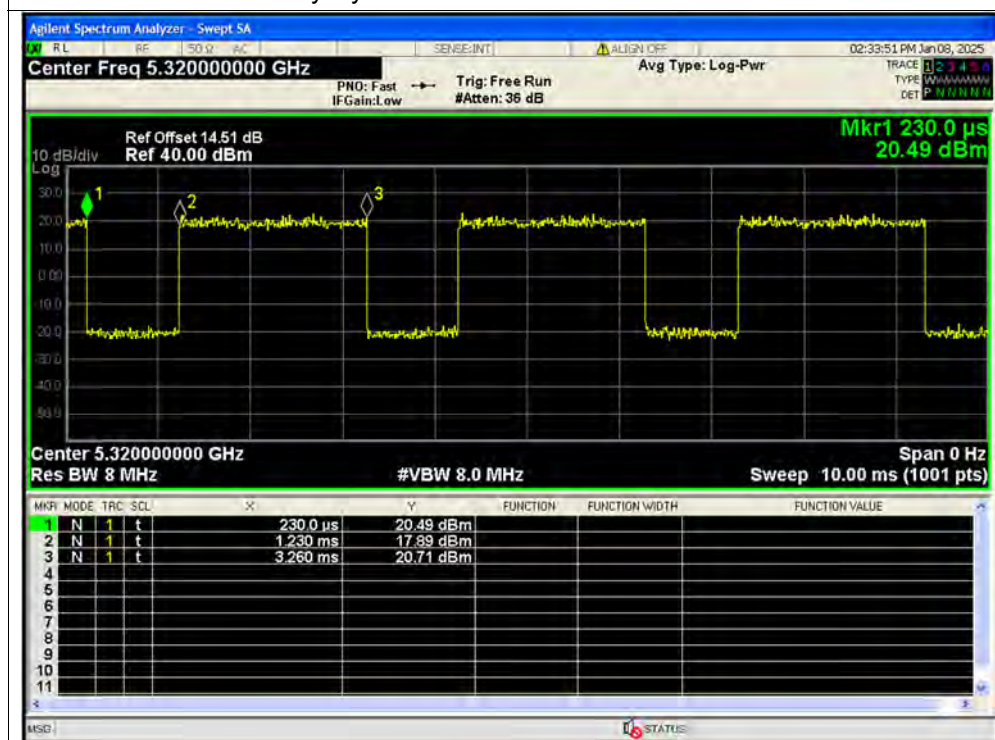
Duty Cycle NVNT a 5260MHz Ant2 SISO



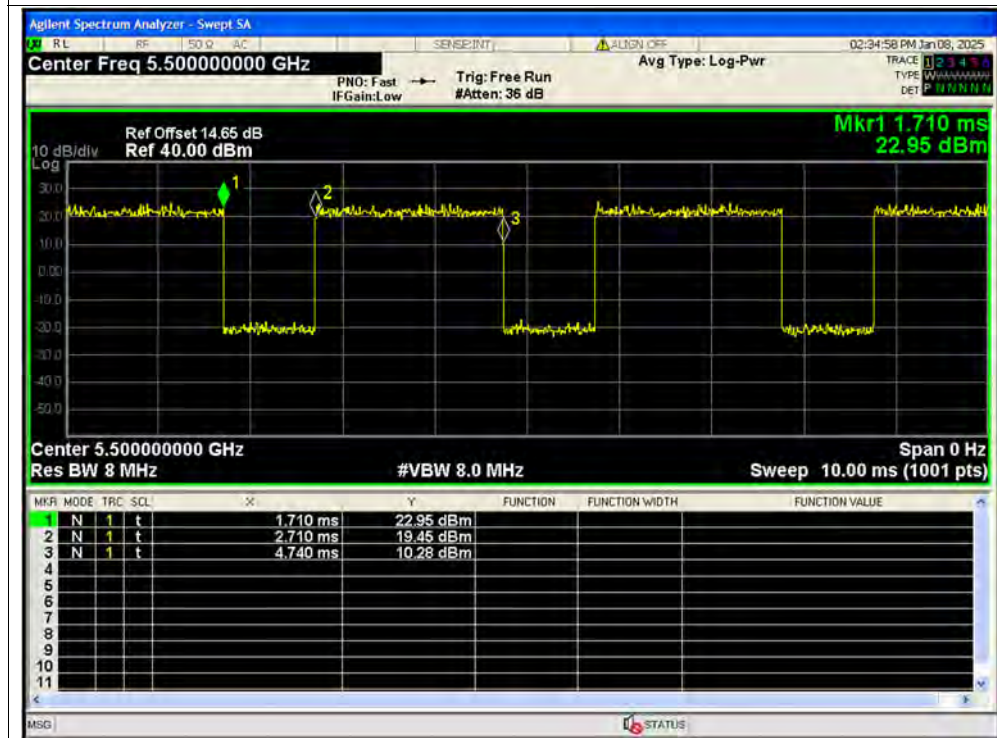
Duty Cycle NVNT a 5300MHz Ant2 SISO



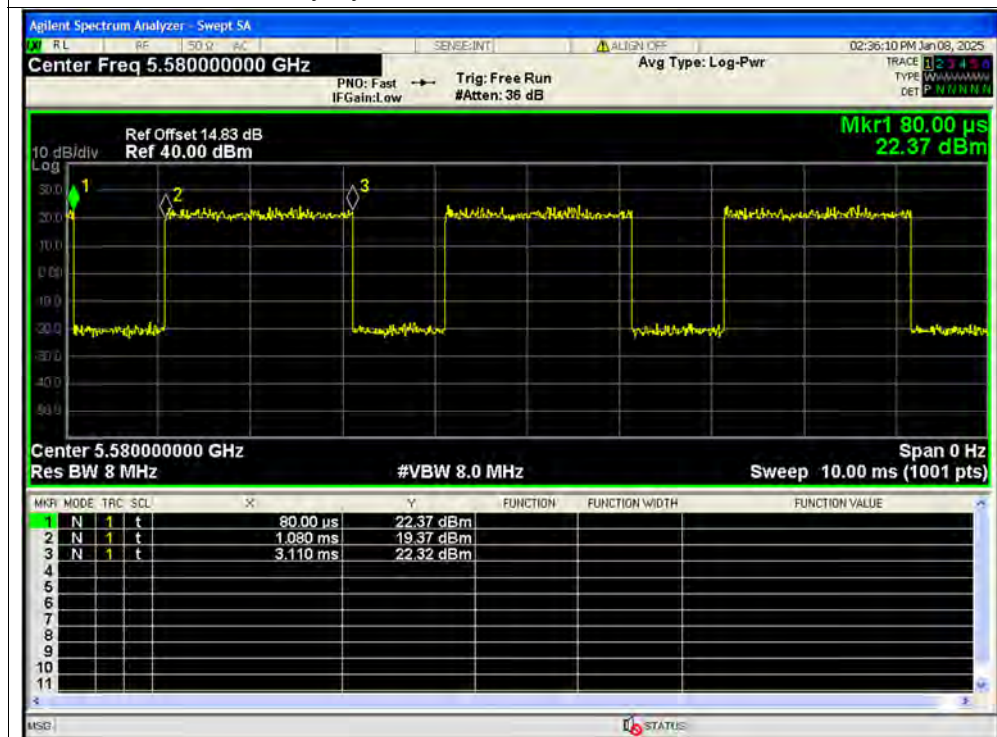
Duty Cycle NVNT a 5320MHz Ant2 SISO



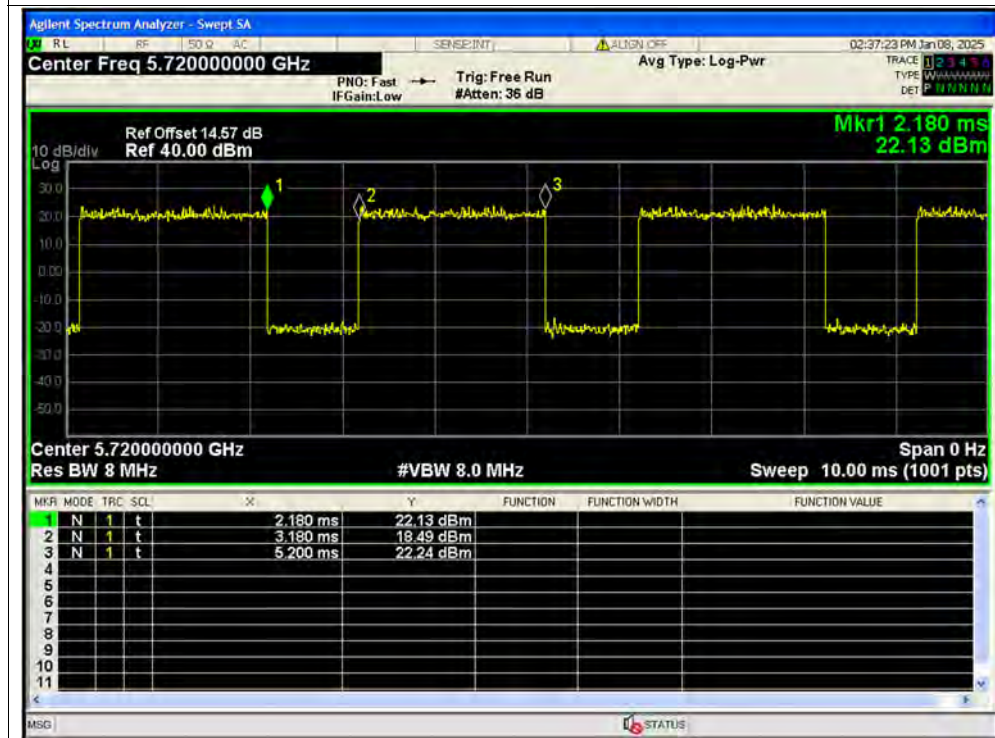
Duty Cycle NVNT a 5500MHz Ant2 SISO



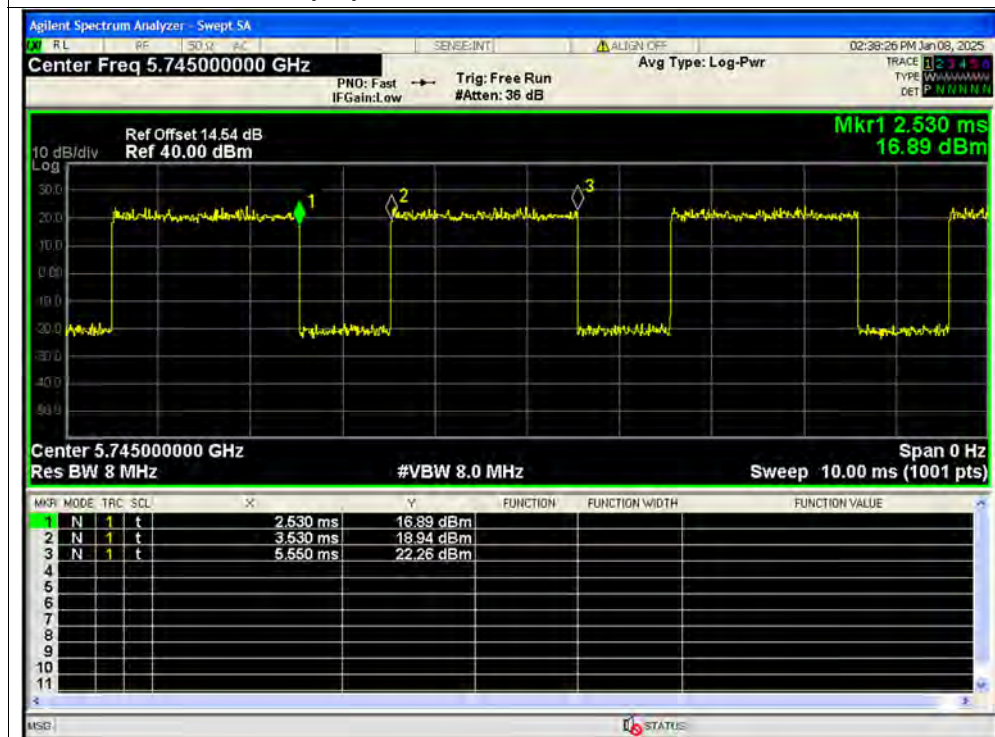
Duty Cycle NVNT a 5580MHz Ant2 SISO



Duty Cycle NVNT a 5720MHz Ant2 SISO

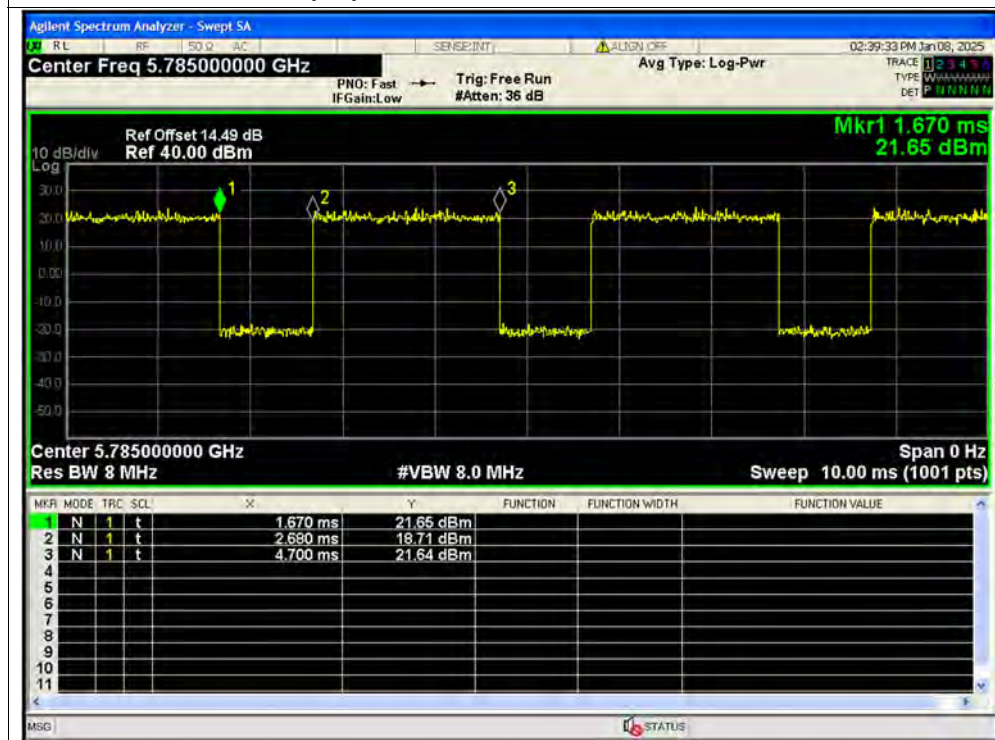


Duty Cycle NVNT a 5745MHz Ant2 SISO

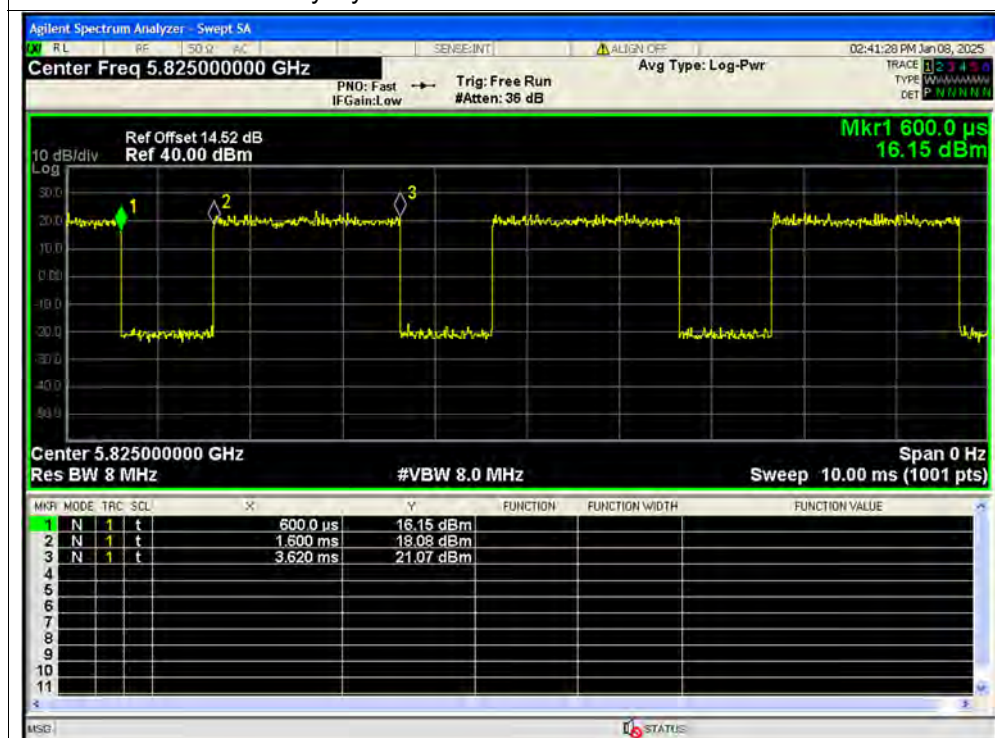




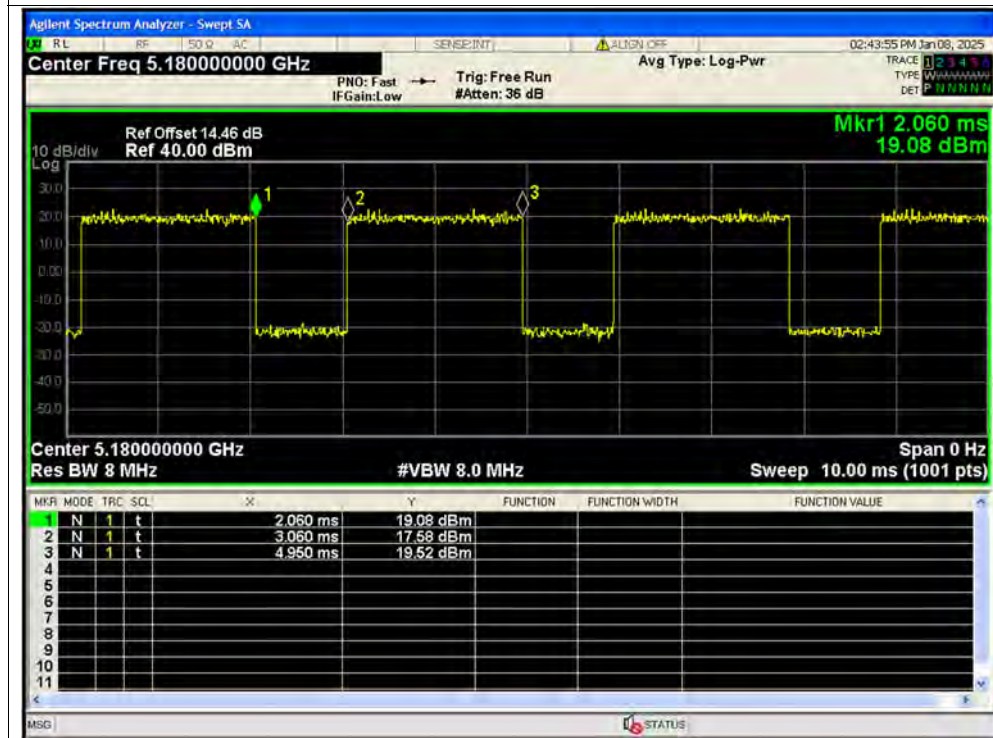
Duty Cycle NVNT a 5785MHz Ant2 SISO



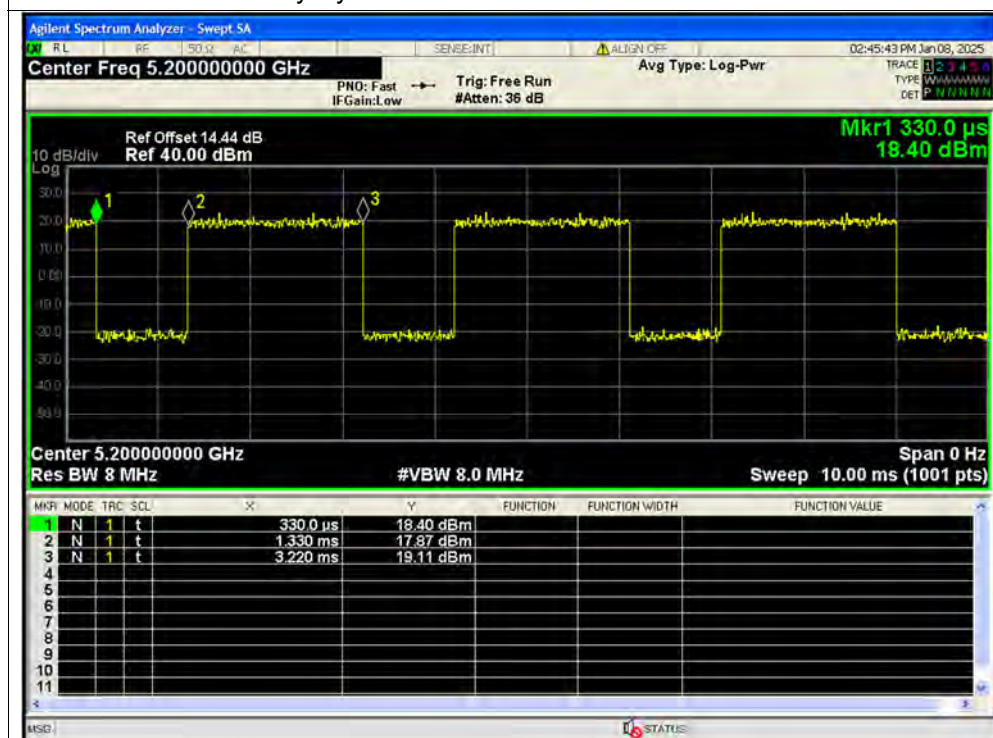
Duty Cycle NVNT a 5825MHz Ant2 SISO



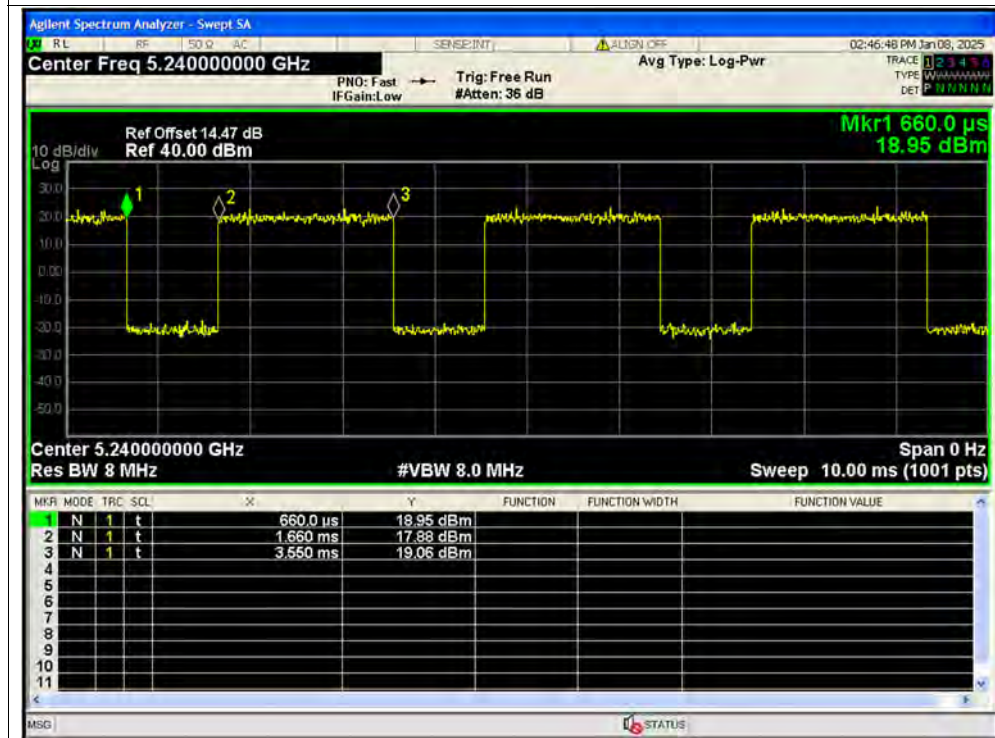
Duty Cycle NVNT n20 5180MHz Ant2 SISO



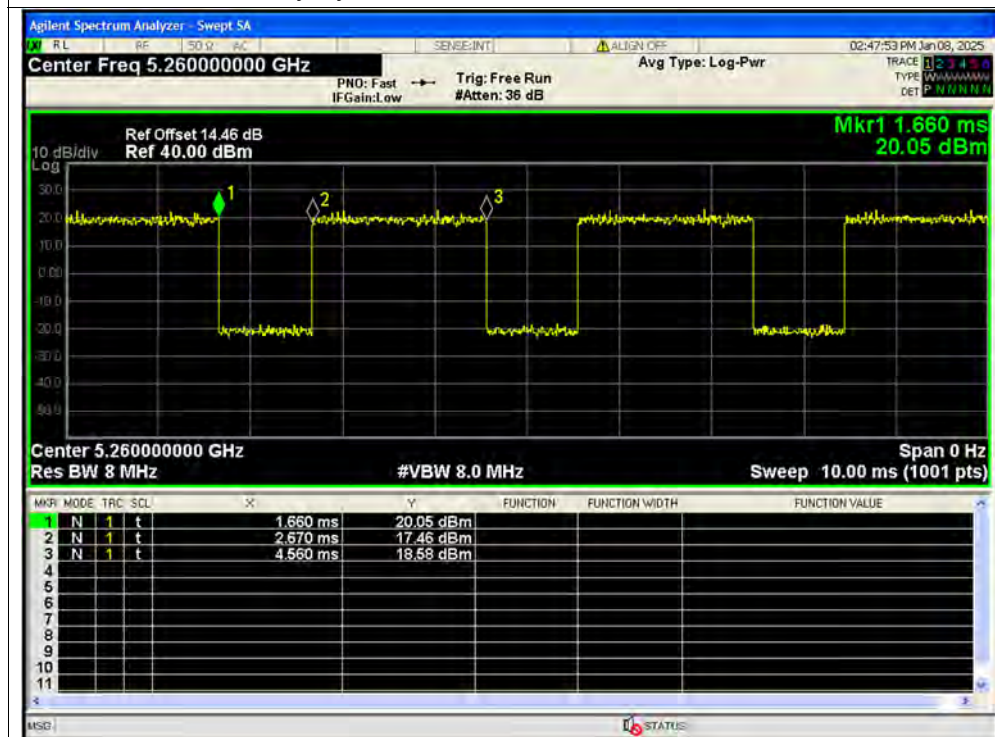
Duty Cycle NVNT n20 5200MHz Ant2 SISO



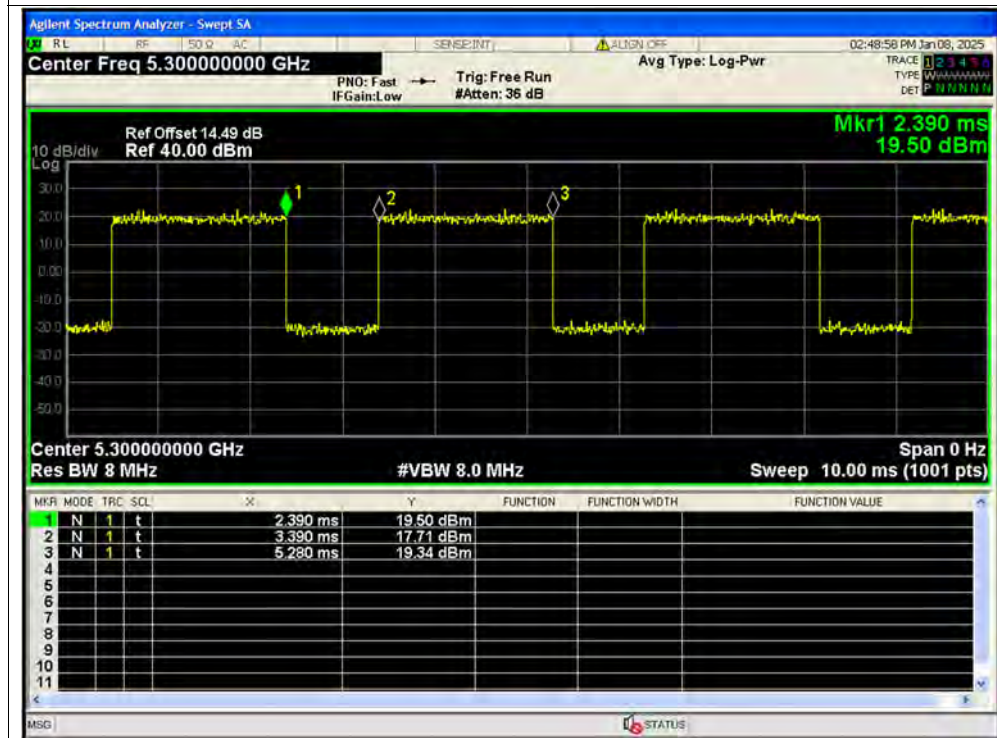
Duty Cycle NVNT n20 5240MHz Ant2 SISO



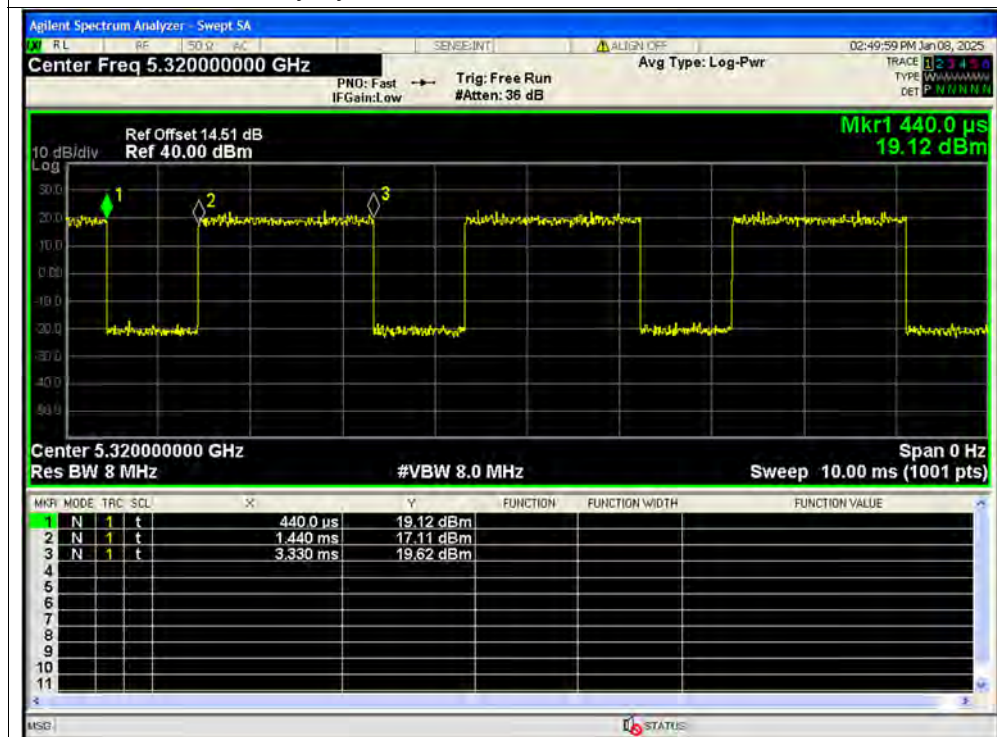
Duty Cycle NVNT n20 5260MHz Ant2 SISO



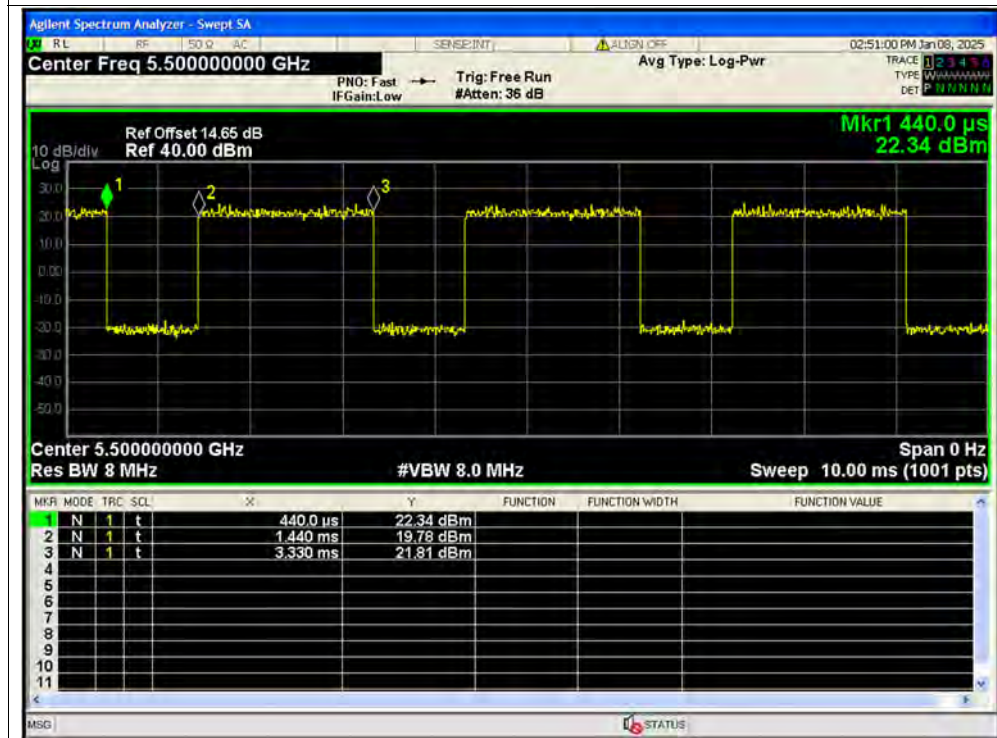
Duty Cycle NVNT n20 5300MHz Ant2 SISO



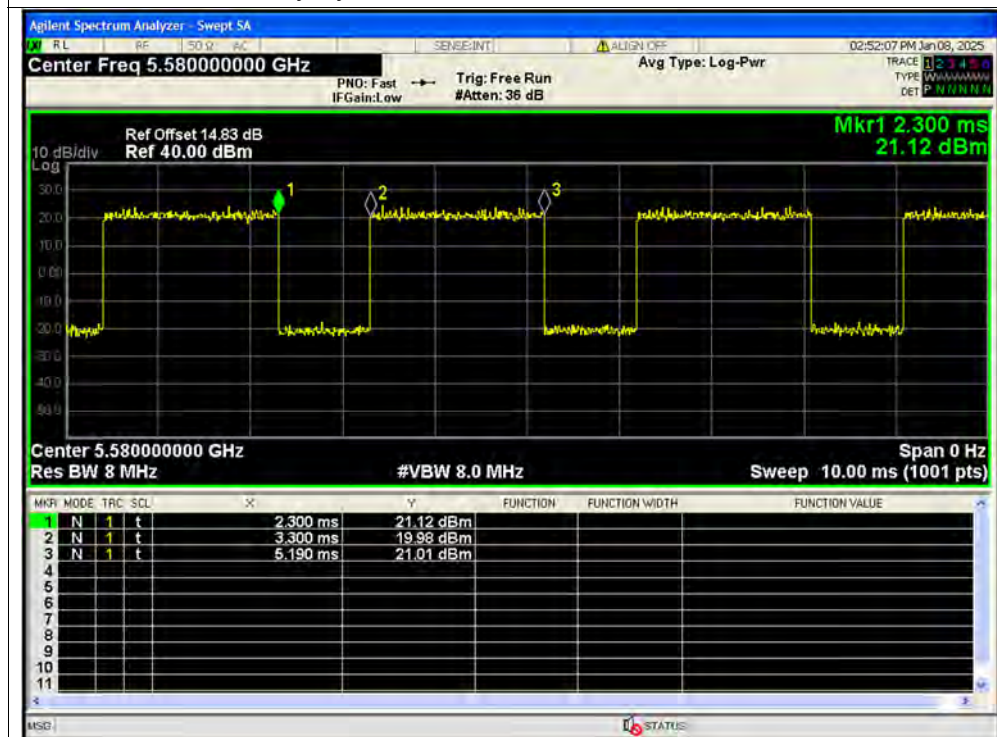
Duty Cycle NVNT n20 5320MHz Ant2 SISO



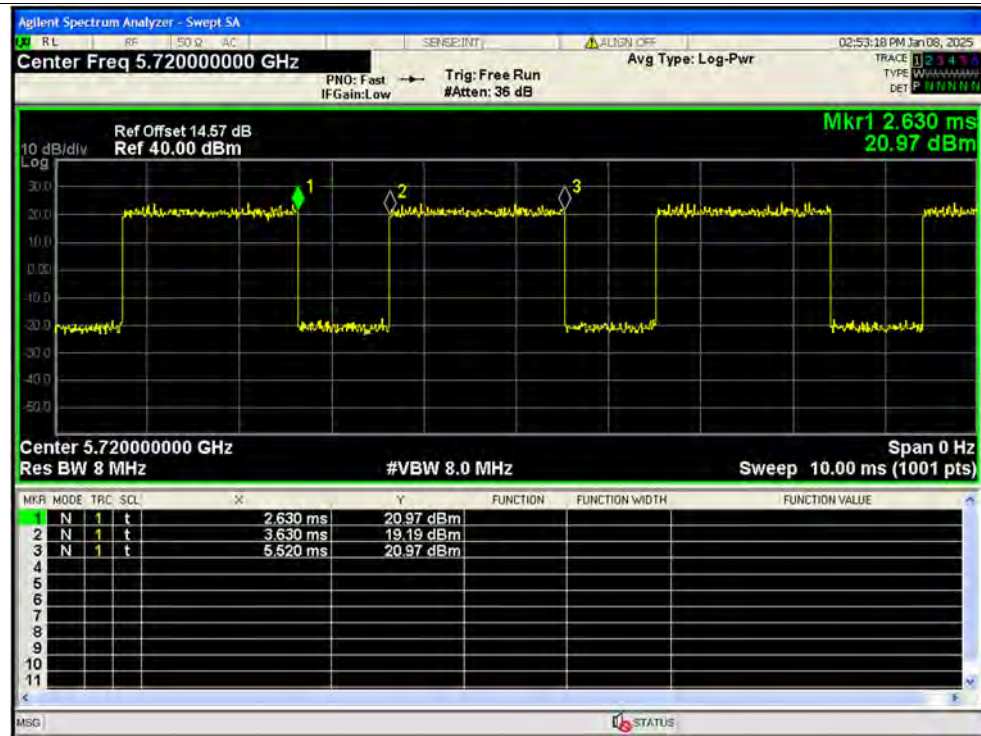
Duty Cycle NVNT n20 5500MHz Ant2 SISO



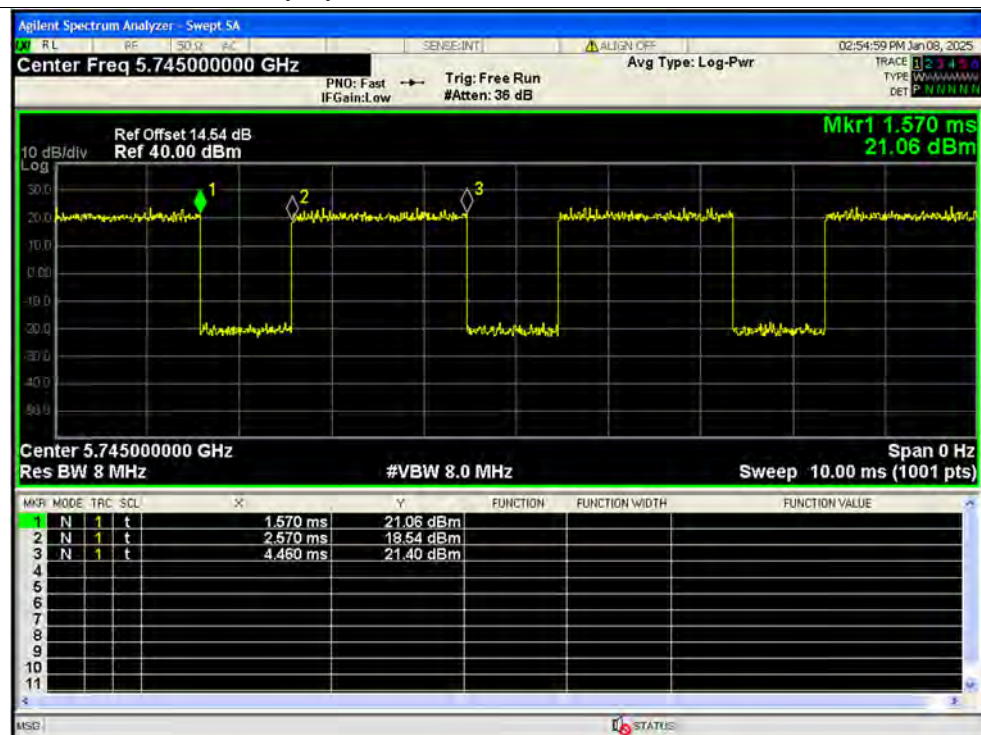
Duty Cycle NVNT n20 5580MHz Ant2 SISO



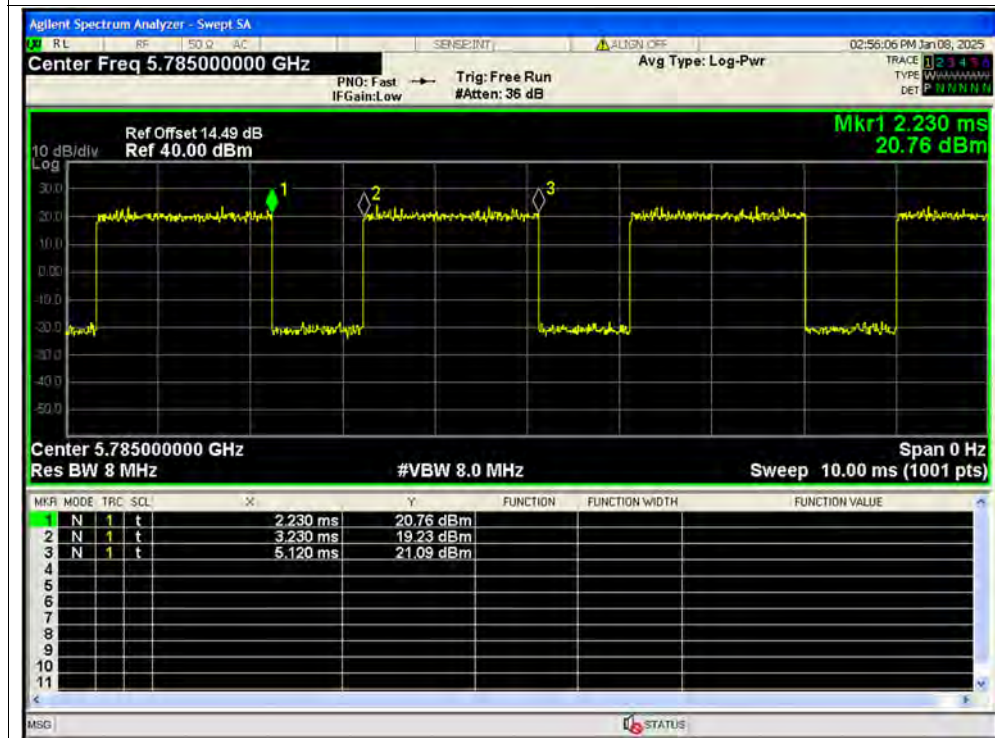
Duty Cycle NVNT n20 5720MHz Ant2 SISO



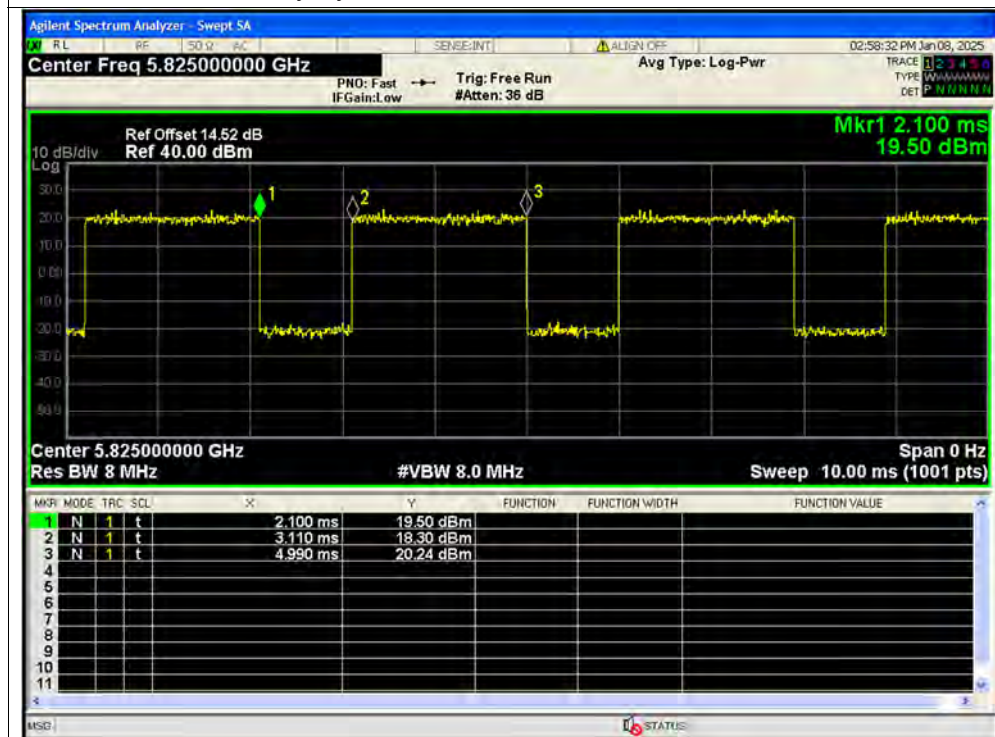
Duty Cycle NVNT n20 5745MHz Ant2 SISO



Duty Cycle NVNT n20 5785MHz Ant2 SISO

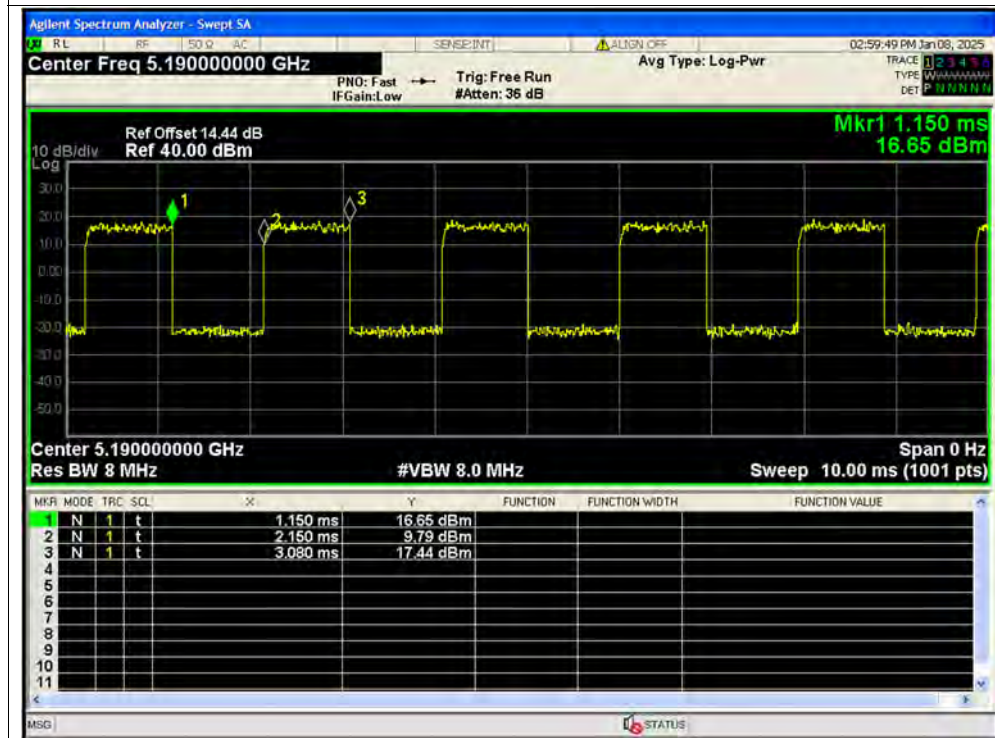


Duty Cycle NVNT n20 5825MHz Ant2 SISO

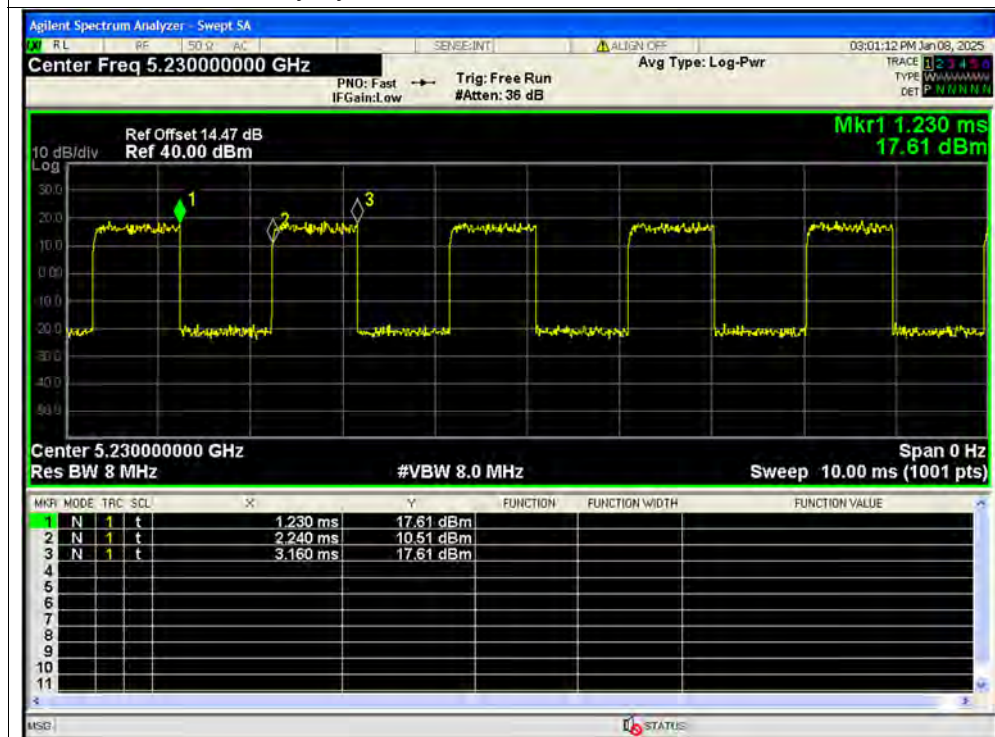




Duty Cycle NVNT n40 5190MHz Ant2 SISO

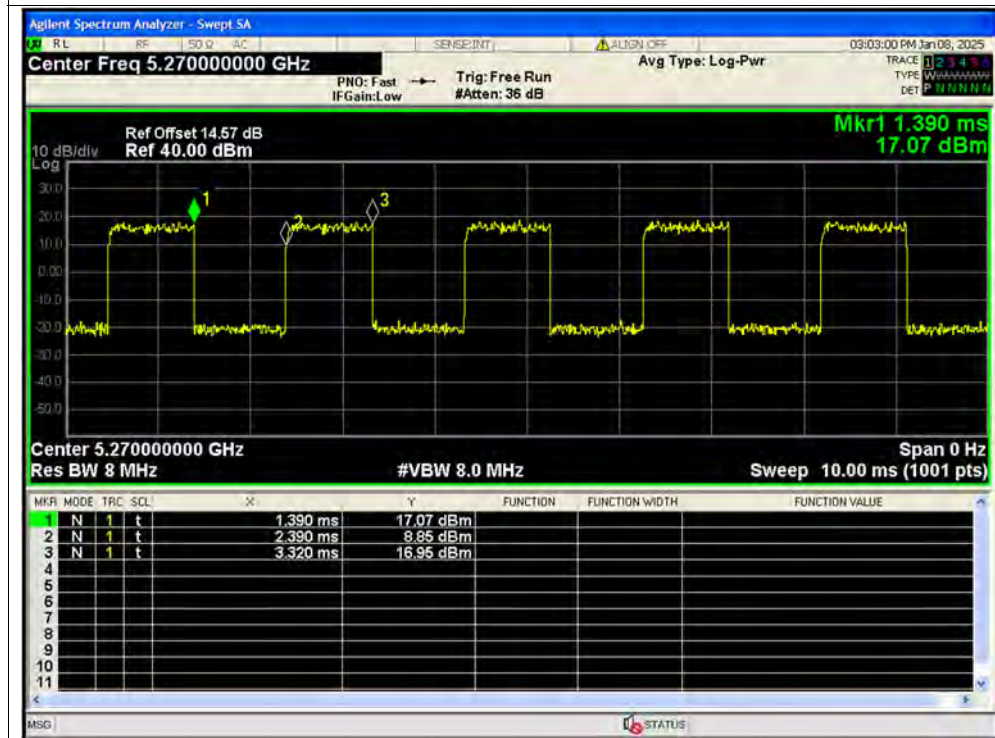


Duty Cycle NVNT n40 5230MHz Ant2 SISO

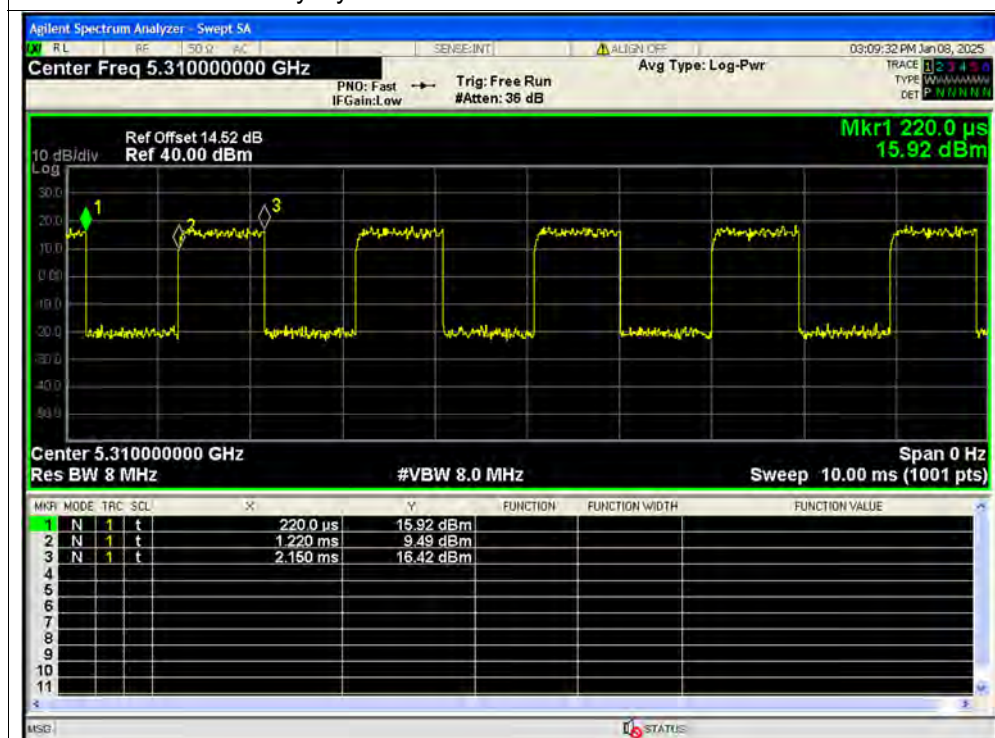




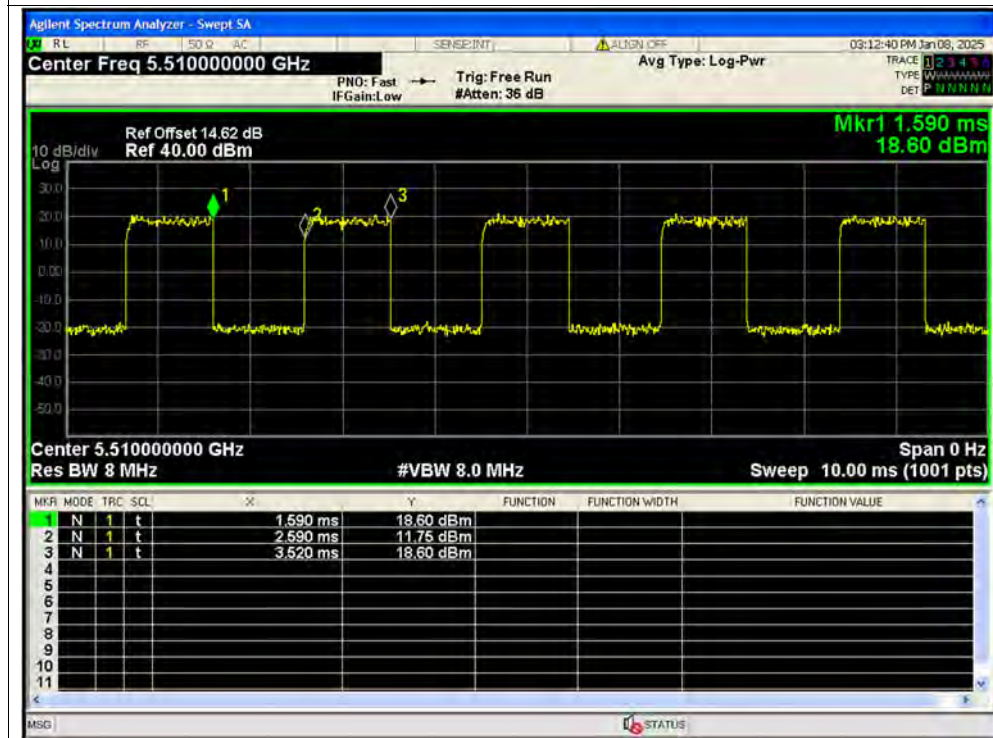
Duty Cycle NVNT n40 5270MHz Ant2 SISO



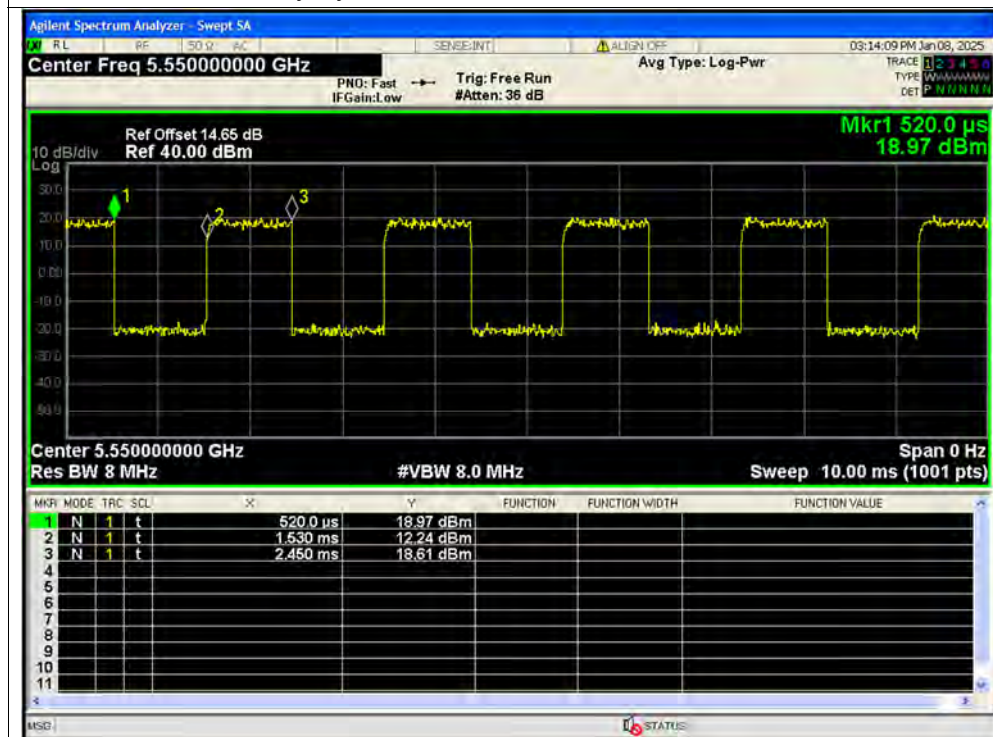
Duty Cycle NVNT n40 5310MHz Ant2 SISO



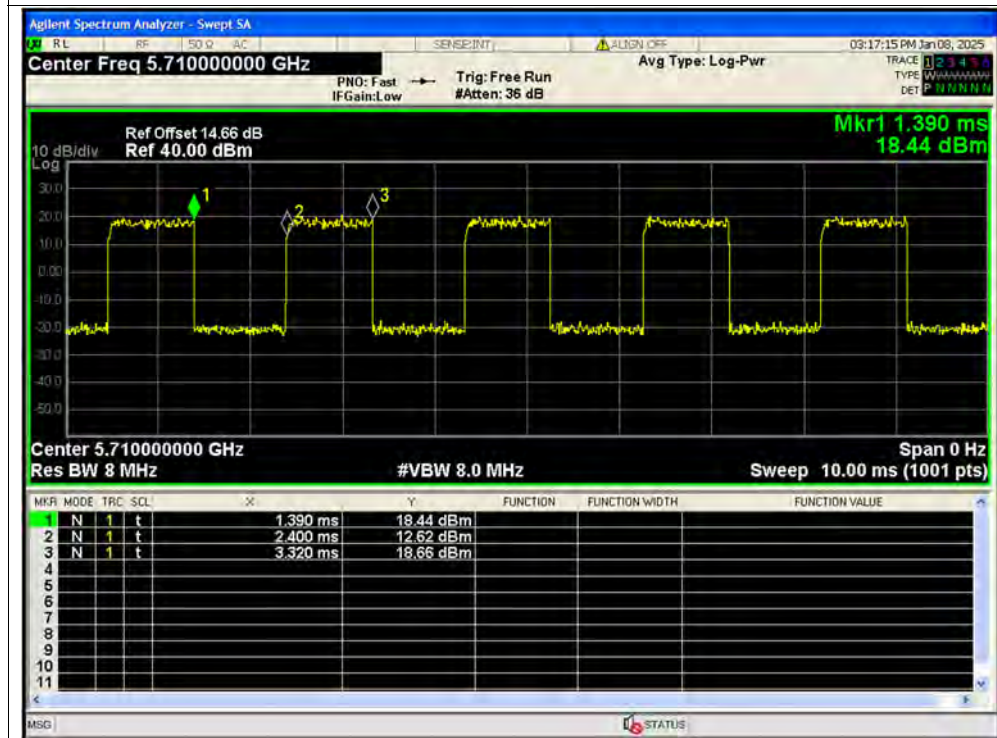
Duty Cycle NVNT n40 5510MHz Ant2 SISO



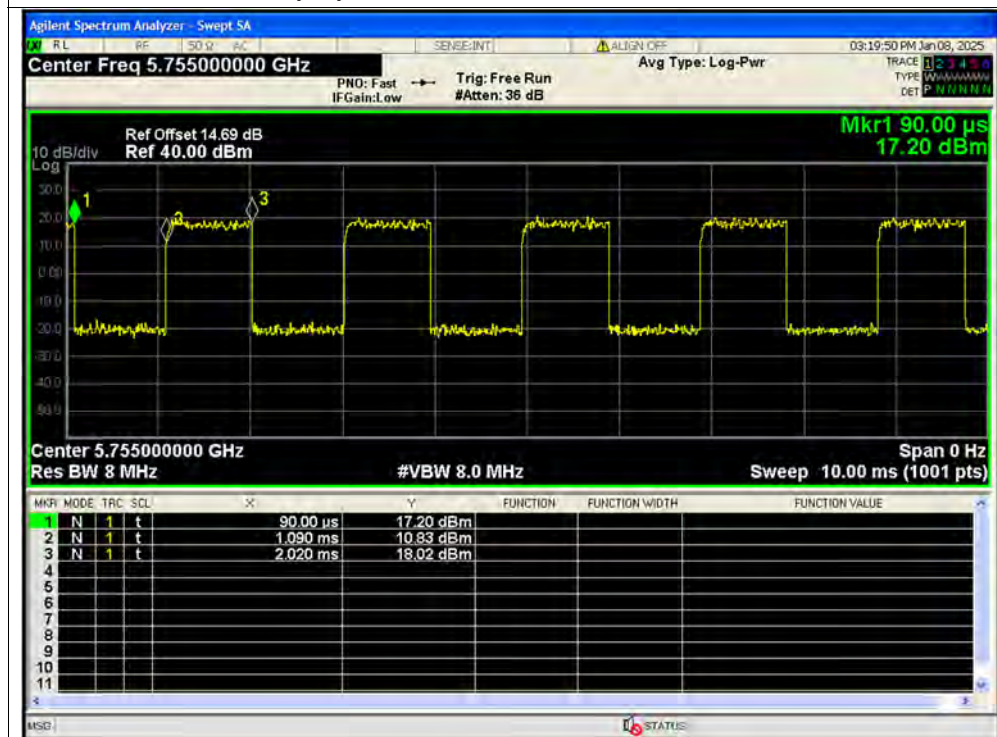
Duty Cycle NVNT n40 5550MHz Ant2 SISO



Duty Cycle NVNT n40 5710MHz Ant2 SISO

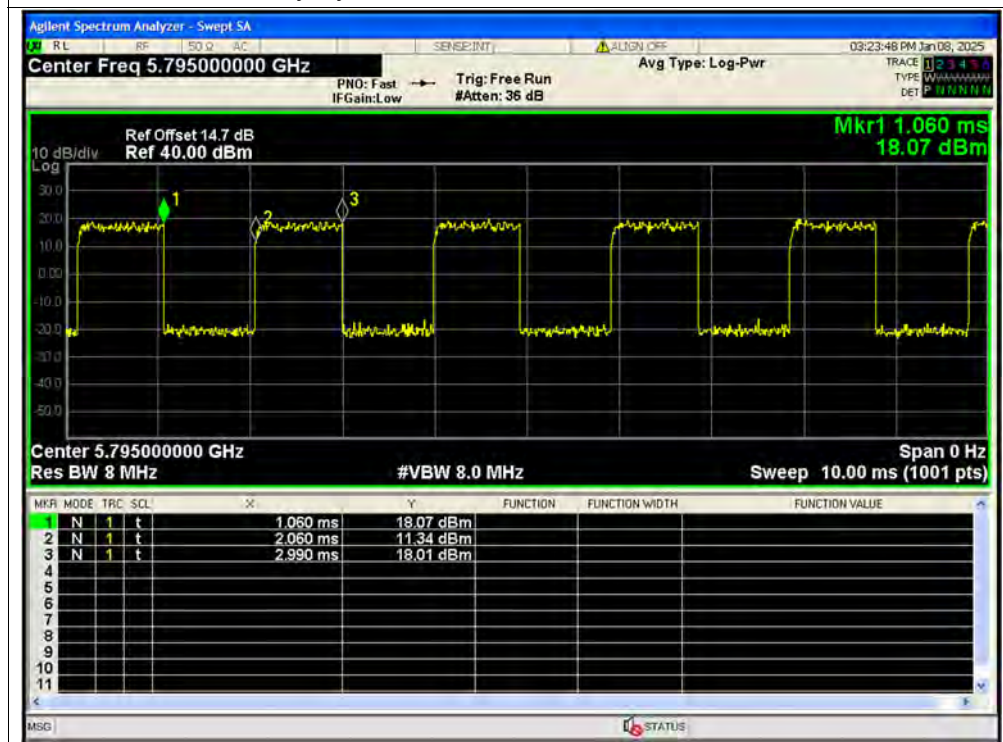


Duty Cycle NVNT n40 5755MHz Ant2 SISO





Duty Cycle NVNT n40 5795MHz Ant2 SISO



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

Condition	Mode	Frequency (MHz)	Antenna	Total Conducted Power (dBm)	Total Conducted Power (W)	Limit Conducted (dBm)	Verdict
NVNT	a	5180	Ant2	15.96	0.03945	24	Pass
NVNT	a	5200	Ant2	15.84	0.03837	24	Pass
NVNT	a	5240	Ant2	15.62	0.03648	24	Pass
NVNT	a	5260	Ant2	15.73	0.03741	24	Pass
NVNT	a	5300	Ant2	15.3	0.03388	24	Pass
NVNT	a	5320	Ant2	14.61	0.02891	24	Pass
NVNT	a	5500	Ant2	17.82	0.06053	24	Pass
NVNT	a	5580	Ant2	17.6	0.05754	24	Pass
NVNT	a	5720	Ant2	17.21	0.0526	24	Pass
NVNT	a	5745	Ant2	17.07	0.05093	30	Pass
NVNT	a	5785	Ant2	16.53	0.04498	30	Pass
NVNT	a	5825	Ant2	16.15	0.04121	30	Pass
NVNT	n20	5180	Ant2	15.89	0.03882	24	Pass
NVNT	n20	5200	Ant2	15.94	0.03926	24	Pass
NVNT	n20	5240	Ant2	15.6	0.03631	24	Pass
NVNT	n20	5260	Ant2	15.66	0.03681	24	Pass
NVNT	n20	5300	Ant2	15.34	0.0342	24	Pass
NVNT	n20	5320	Ant2	14.61	0.02891	24	Pass
NVNT	n20	5500	Ant2	17.73	0.05929	24	Pass
NVNT	n20	5580	Ant2	17.61	0.05768	24	Pass
NVNT	n20	5720	Ant2	17.37	0.05458	24	Pass
NVNT	n20	5745	Ant2	17.05	0.0507	30	Pass
NVNT	n20	5785	Ant2	16.56	0.04529	30	Pass
NVNT	n20	5825	Ant2	16.16	0.0413	30	Pass
NVNT	n40	5190	Ant2	15.21	0.03319	24	Pass
NVNT	n40	5230	Ant2	15.13	0.03258	24	Pass
NVNT	n40	5270	Ant2	14.82	0.03034	24	Pass
NVNT	n40	5310	Ant2	14.26	0.02667	24	Pass
NVNT	n40	5510	Ant2	17.35	0.05433	24	Pass
NVNT	n40	5550	Ant2	17.2	0.05248	24	Pass
NVNT	n40	5710	Ant2	16.9	0.04898	24	Pass
NVNT	n40	5755	Ant2	16.84	0.04831	30	Pass
NVNT	n40	5795	Ant2	16.08	0.04055	30	Pass

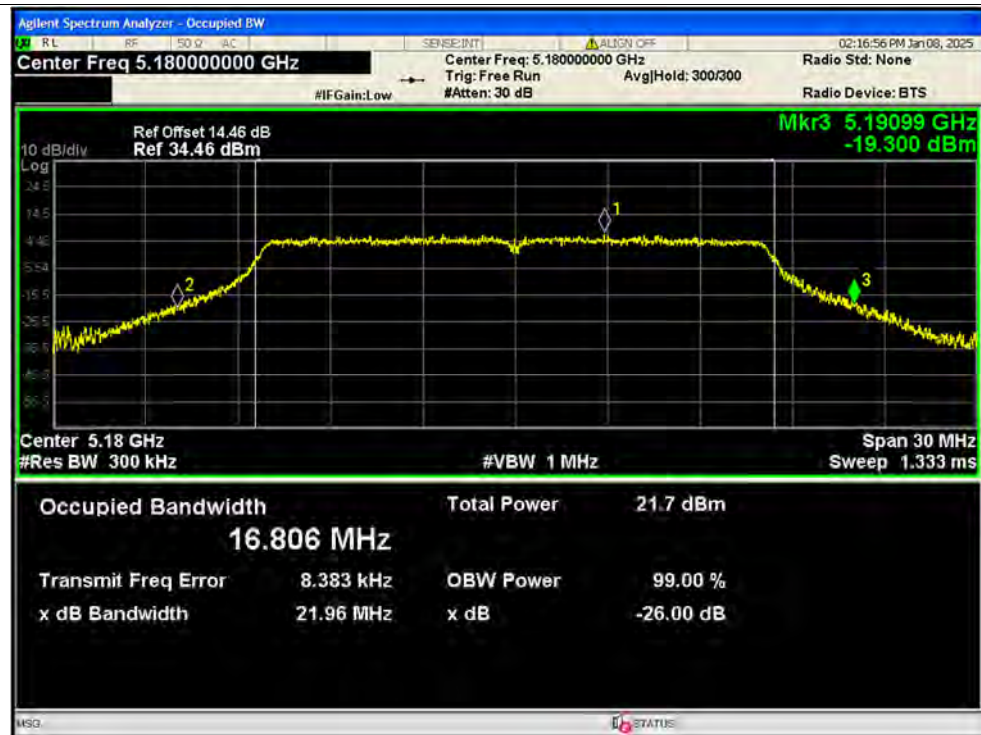
**A.3. Emission Bandwidth****a) 26 dB Bandwidth**

Condition	Mode	Frequency (MHz)	Antenna	-26 dB Bandwidth (MHz)
NVNT	a	5180	Ant2	21.96
NVNT	a	5200	Ant2	21.97
NVNT	a	5240	Ant2	22.04
NVNT	a	5260	Ant2	22.04
NVNT	a	5300	Ant2	21.91
NVNT	a	5320	Ant2	22.24
NVNT	a	5500	Ant2	25.83
NVNT	a	5580	Ant2	22.07
NVNT	a	5720	Ant2	22.4
NVNT	n20	5180	Ant2	23.92
NVNT	n20	5200	Ant2	23.89
NVNT	n20	5240	Ant2	23.16
NVNT	n20	5260	Ant2	23.62
NVNT	n20	5300	Ant2	23.46
NVNT	n20	5320	Ant2	24.05
NVNT	n20	5500	Ant2	25.97
NVNT	n20	5580	Ant2	23.63
NVNT	n20	5720	Ant2	23.35
NVNT	n40	5190	Ant2	39.27
NVNT	n40	5230	Ant2	39.12
NVNT	n40	5270	Ant2	38.97
NVNT	n40	5310	Ant2	39.18
NVNT	n40	5510	Ant2	47.23
NVNT	n40	5550	Ant2	38.98
NVNT	n40	5710	Ant2	39.14

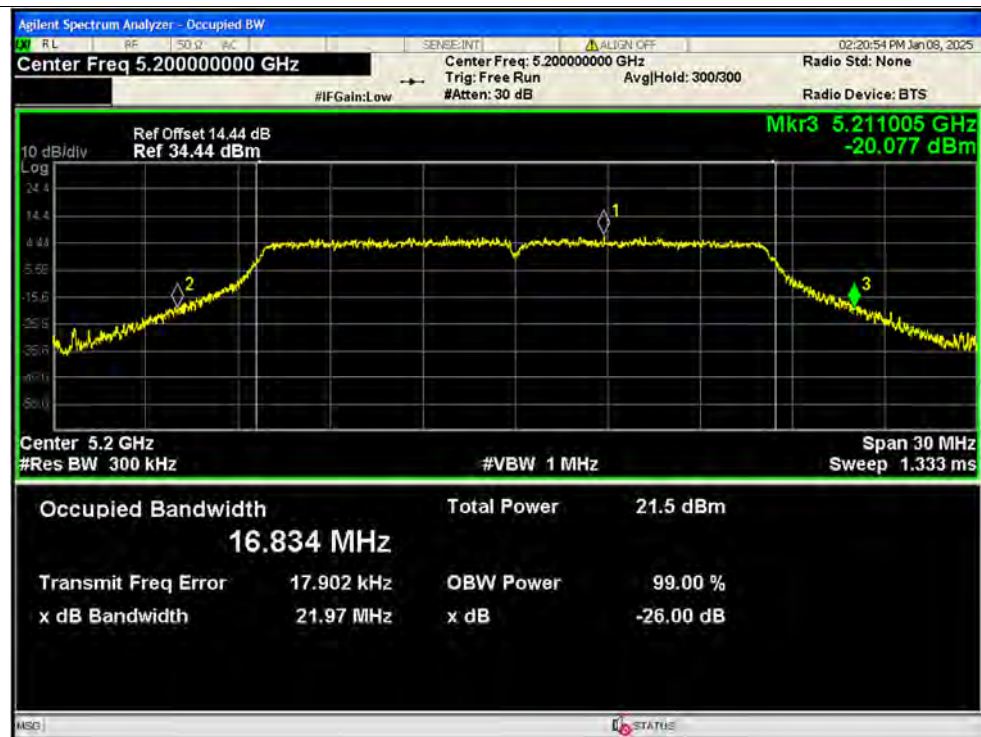


Test Graphs

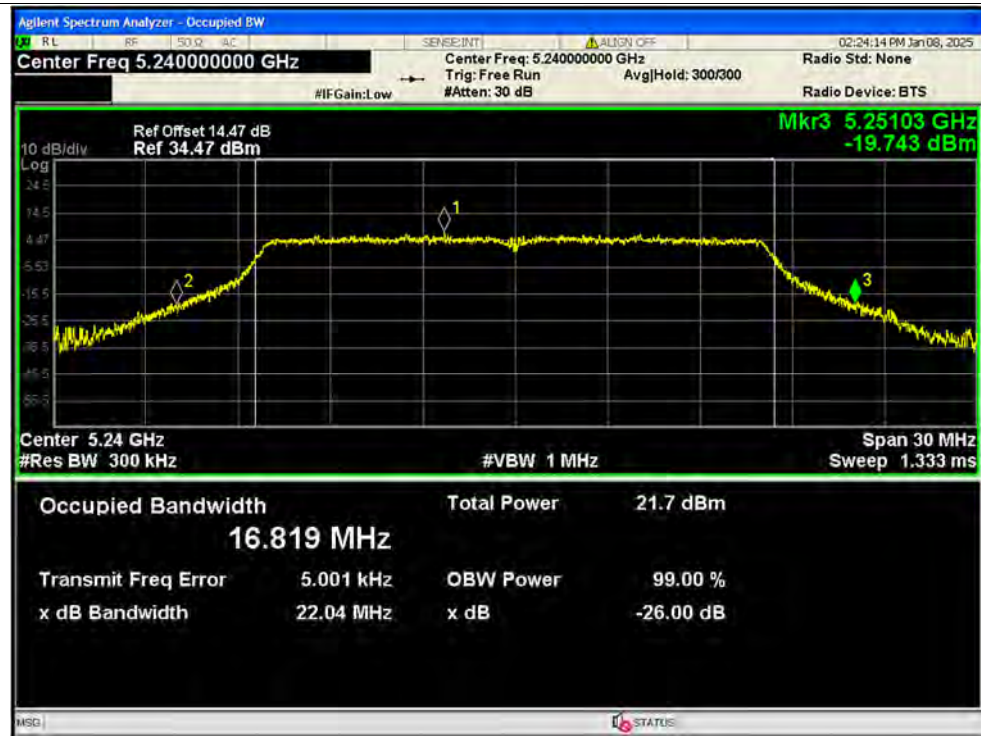
-26dB Bandwidth NVNT a 5180MHz Ant2 SISO



-26dB Bandwidth NVNT a 5200MHz Ant2 SISO



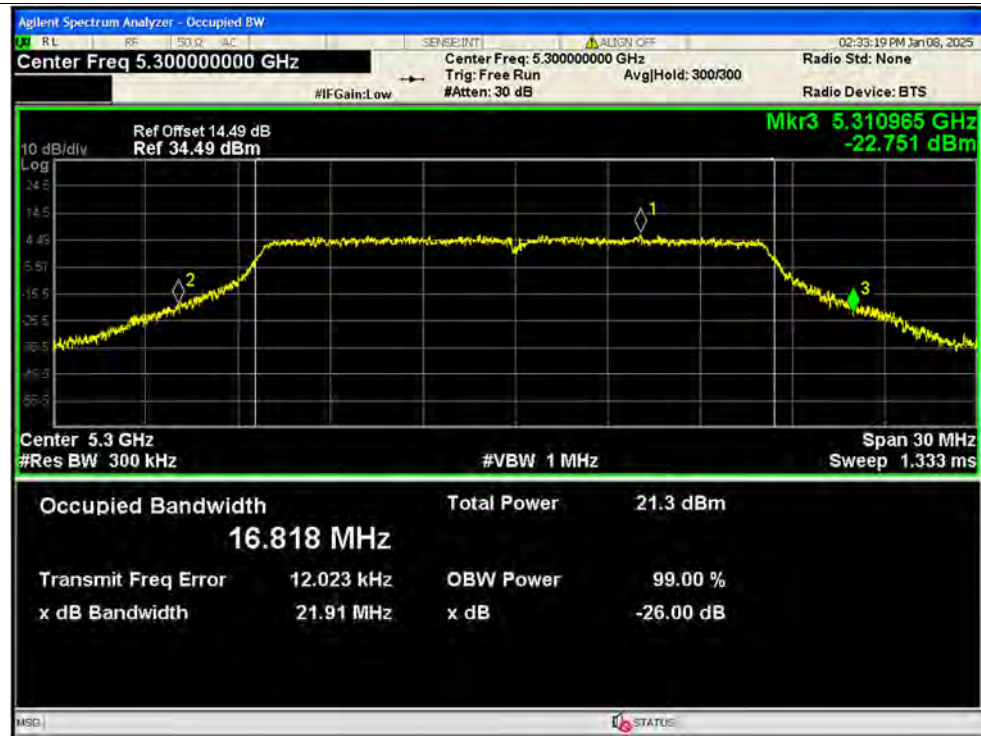
-26dB Bandwidth NVNT a 5240MHz Ant2 SISO



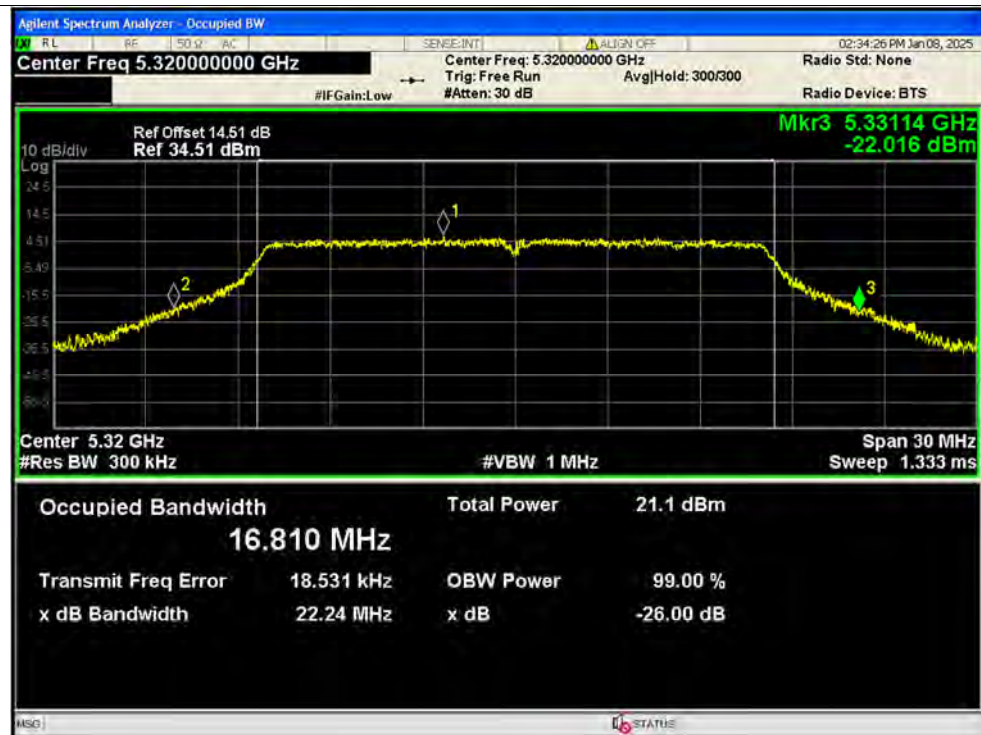
-26dB Bandwidth NVNT a 5260MHz Ant2 SISO



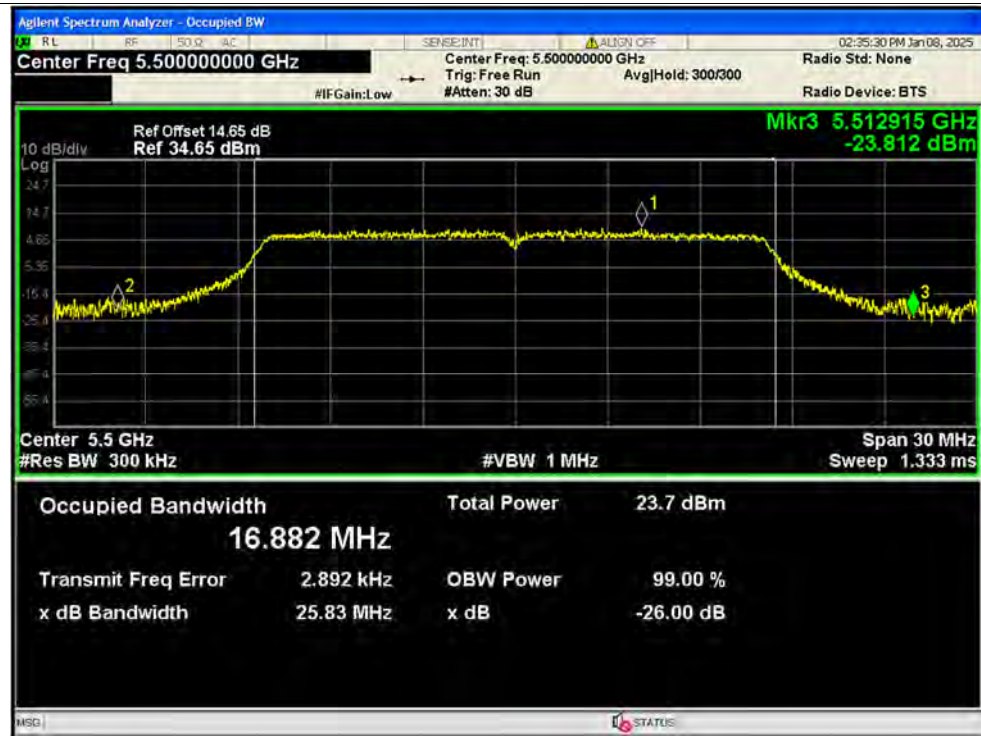
-26dB Bandwidth NVNT a 5300MHz Ant2 SISO



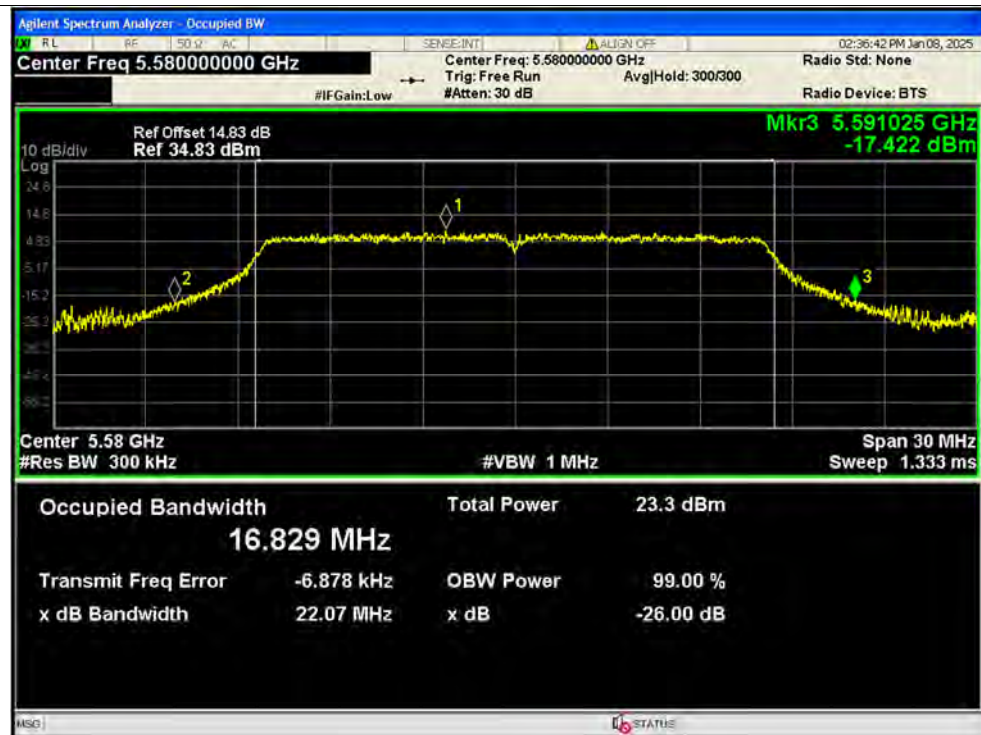
-26dB Bandwidth NVNT a 5320MHz Ant2 SISO



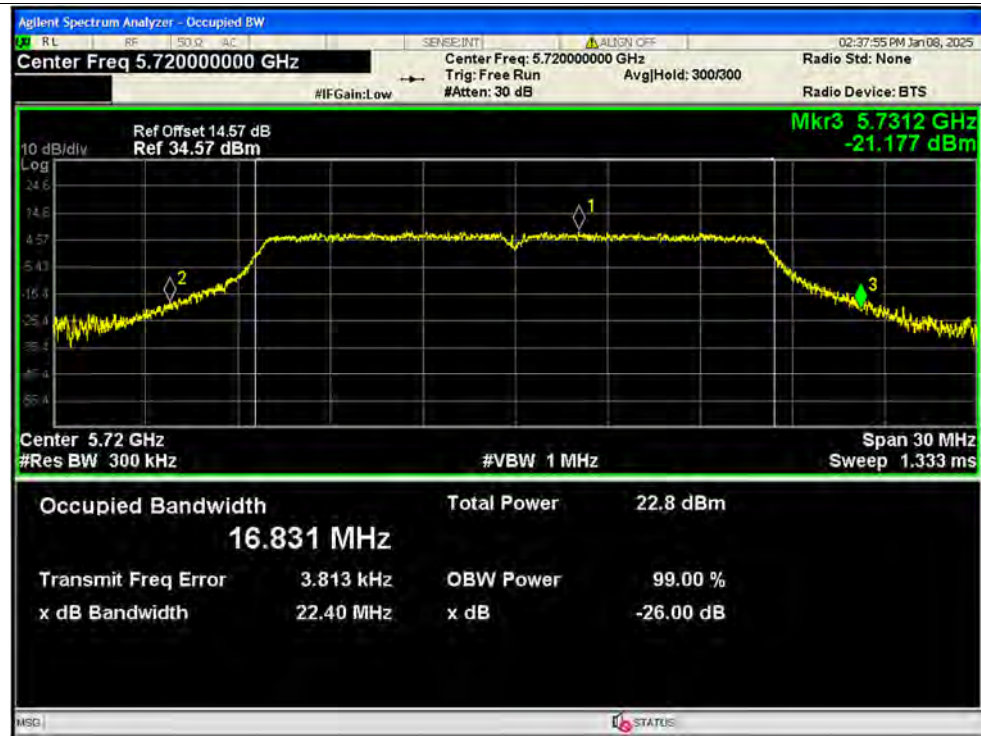
-26dB Bandwidth NVNT a 5500MHz Ant2 SISO



-26dB Bandwidth NVNT a 5580MHz Ant2 SISO



-26dB Bandwidth NVNT a 5720MHz Ant2 SISO

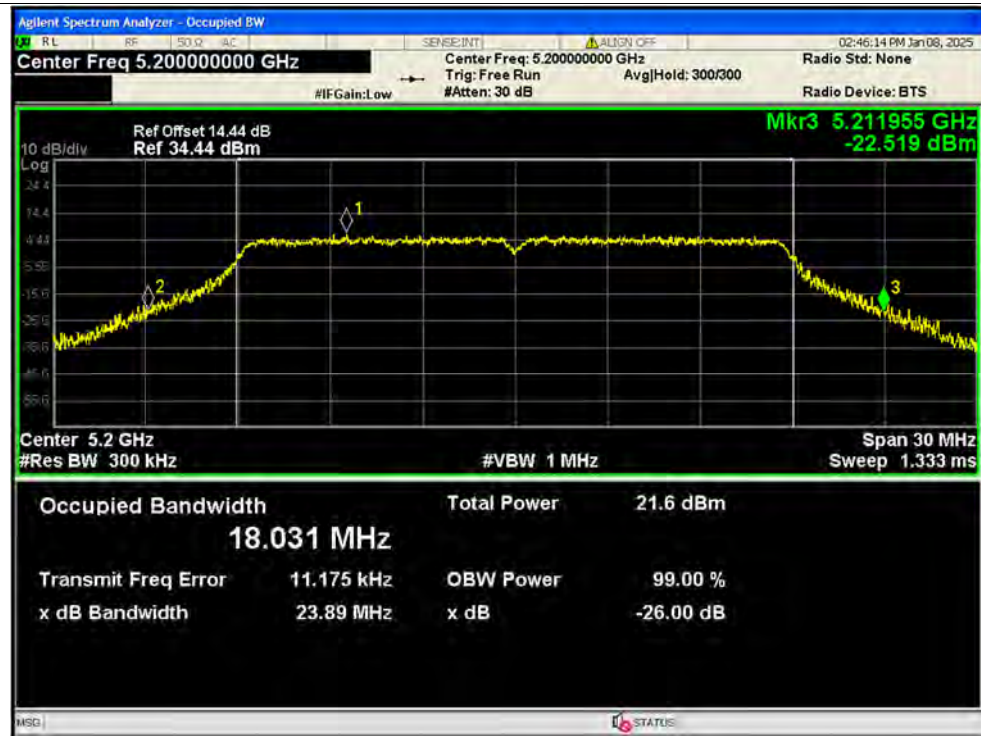


-26dB Bandwidth NVNT n20 5180MHz Ant2 SISO

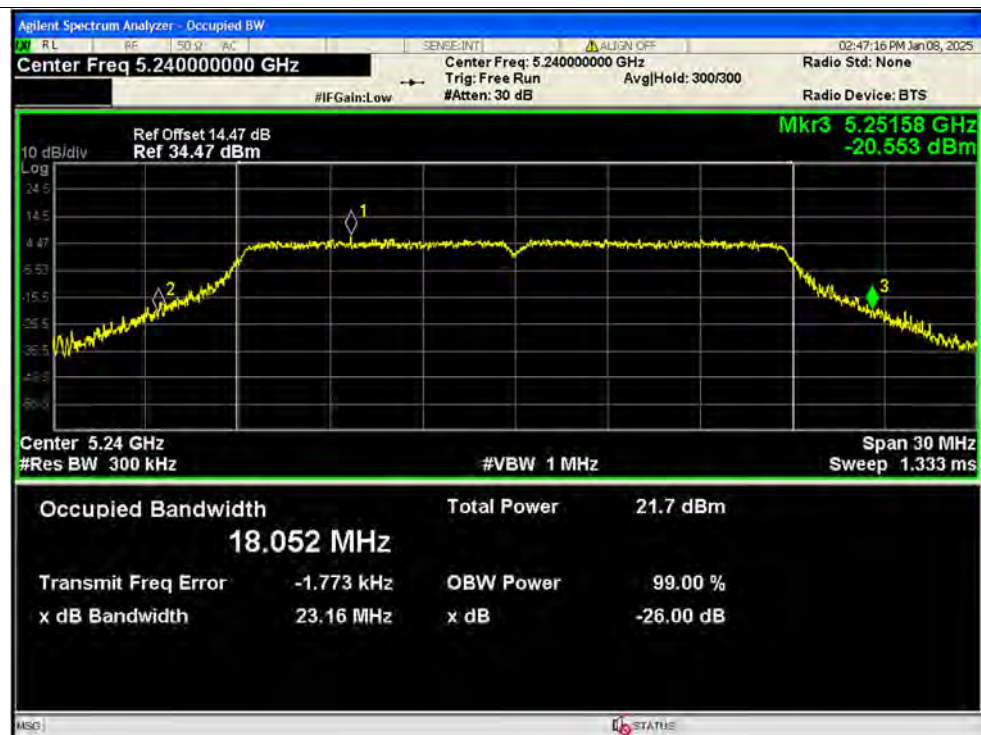




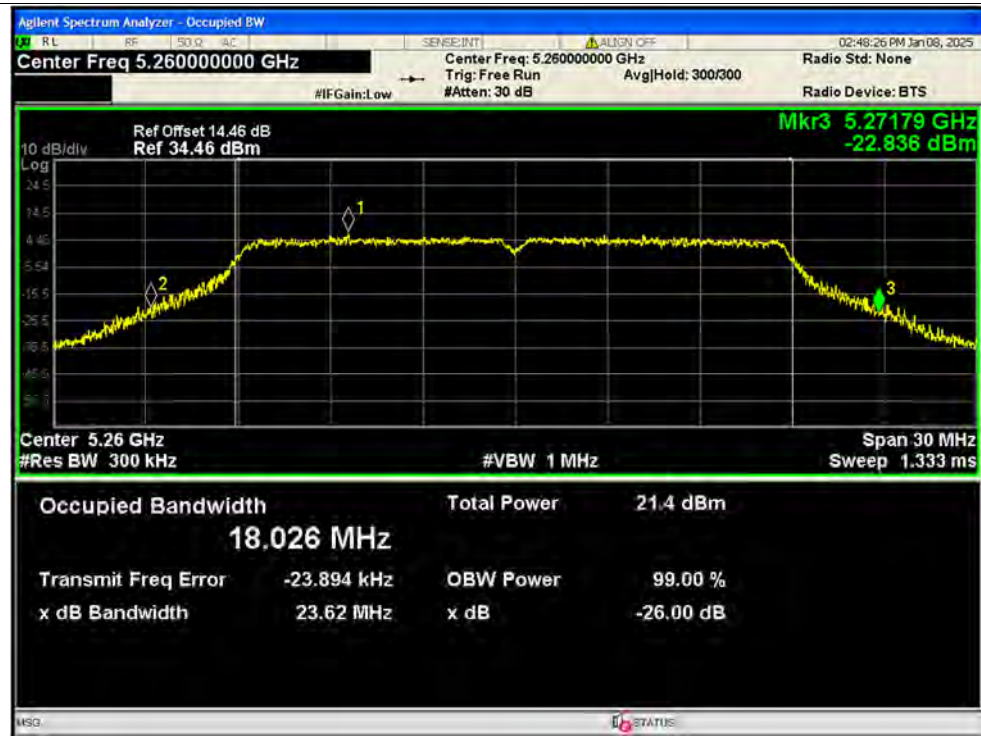
-26dB Bandwidth NVNT n20 5200MHz Ant2 SISO



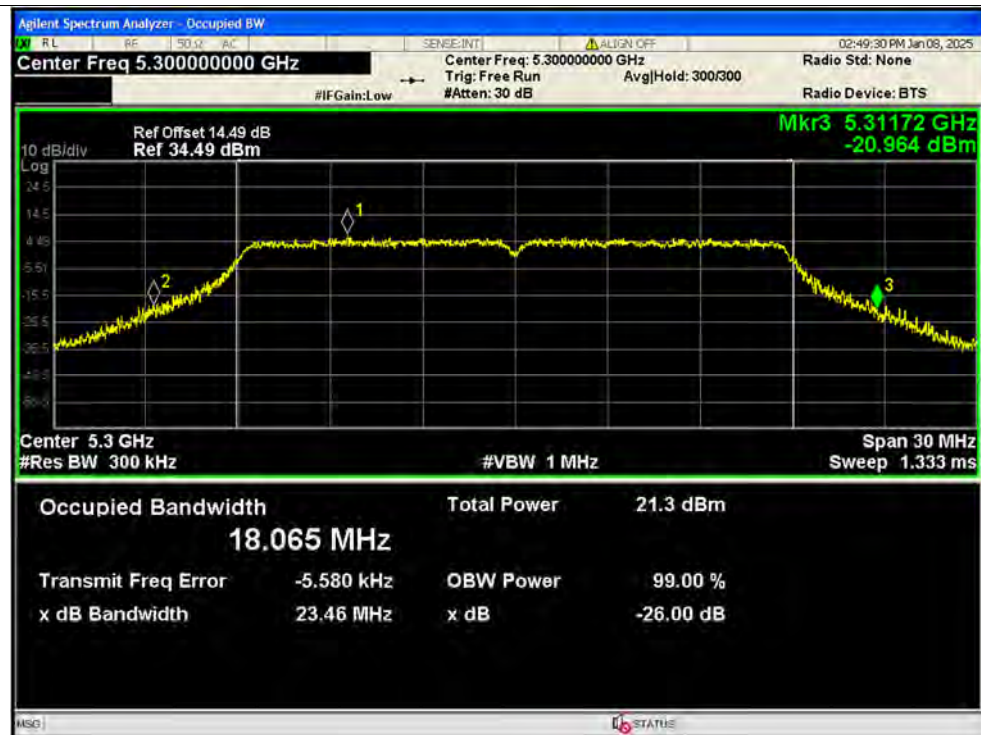
-26dB Bandwidth NVNT n20 5240MHz Ant2 SISO



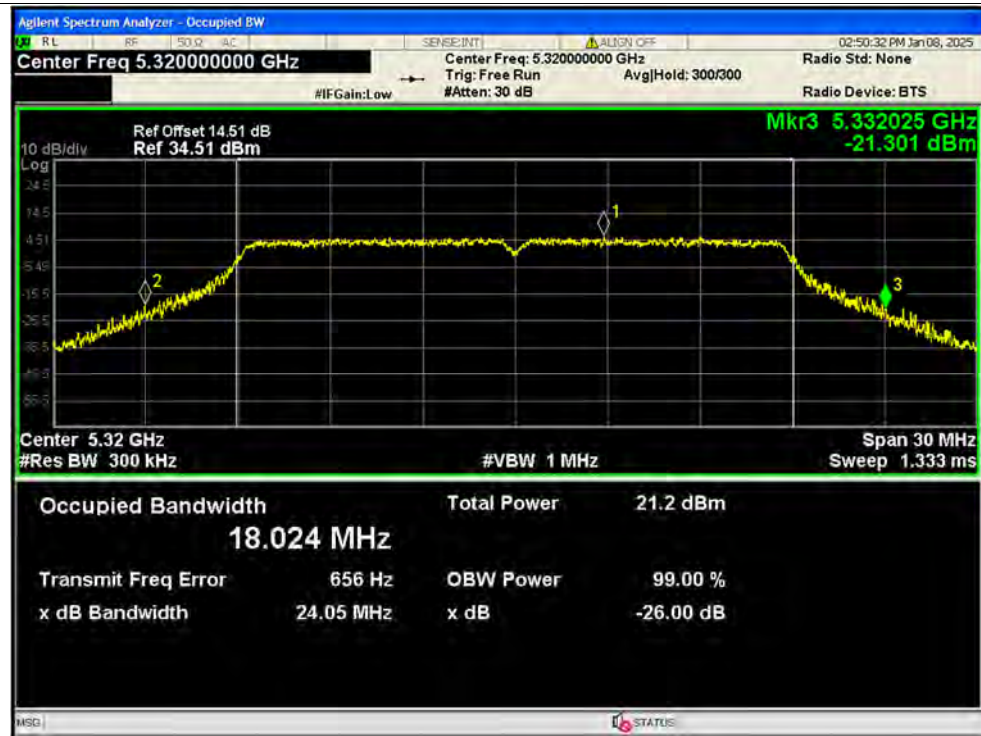
-26dB Bandwidth NVNT n20 5260MHz Ant2 SISO



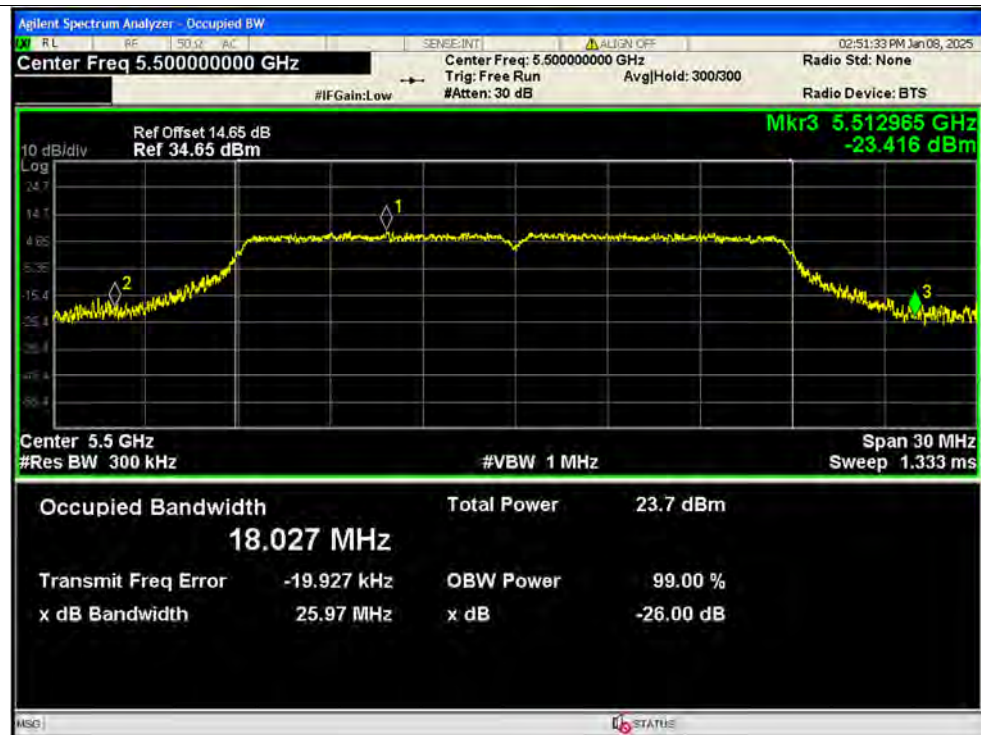
-26dB Bandwidth NVNT n20 5300MHz Ant2 SISO



-26dB Bandwidth NVNT n20 5320MHz Ant2 SISO

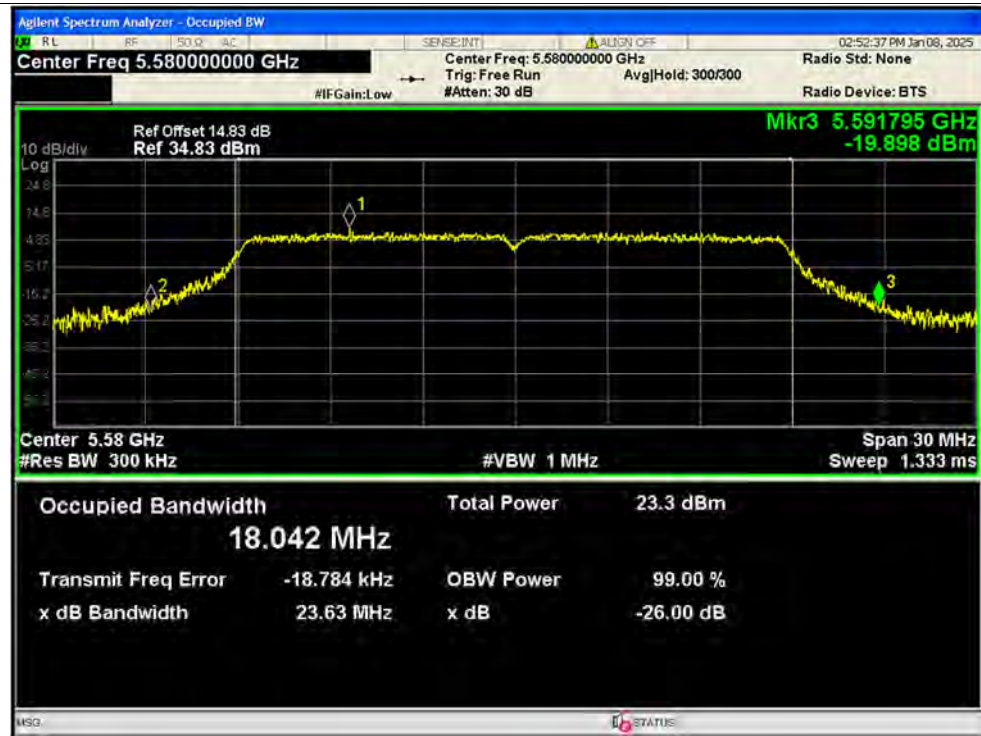


-26dB Bandwidth NVNT n20 5500MHz Ant2 SISO

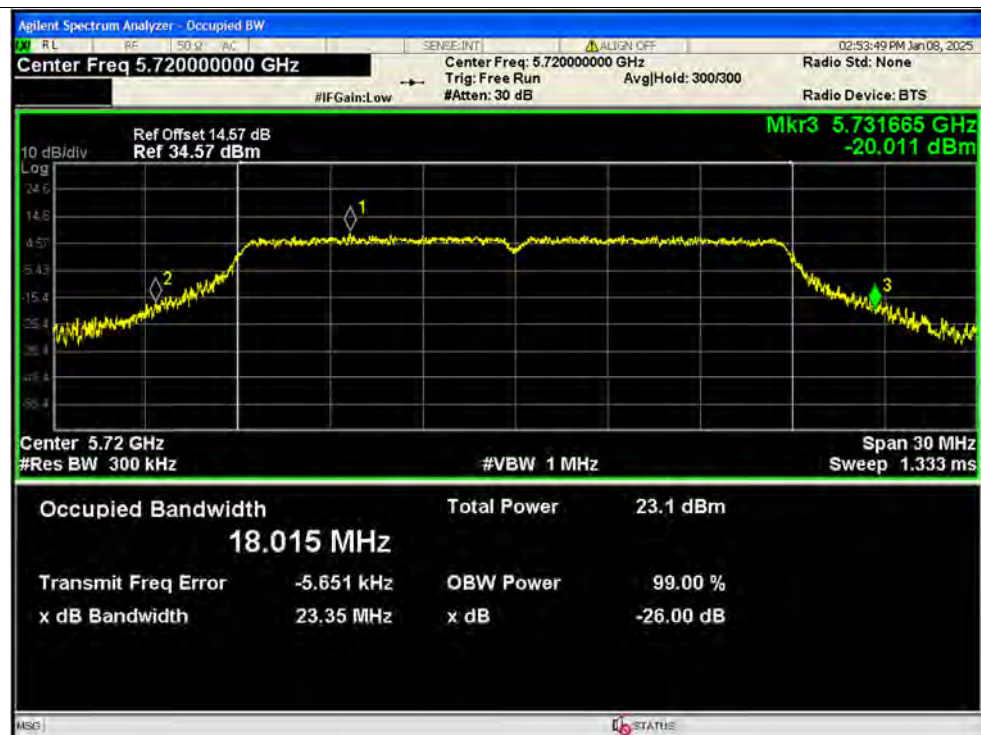




-26dB Bandwidth NVNT n20 5580MHz Ant2 SISO

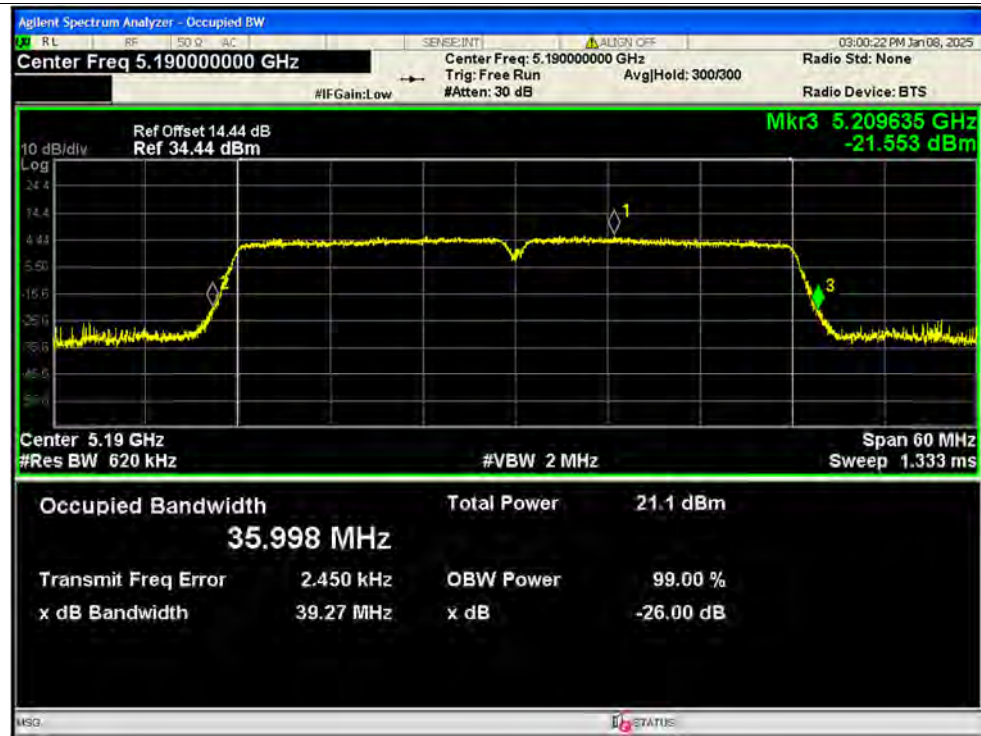


-26dB Bandwidth NVNT n20 5720MHz Ant2 SISO

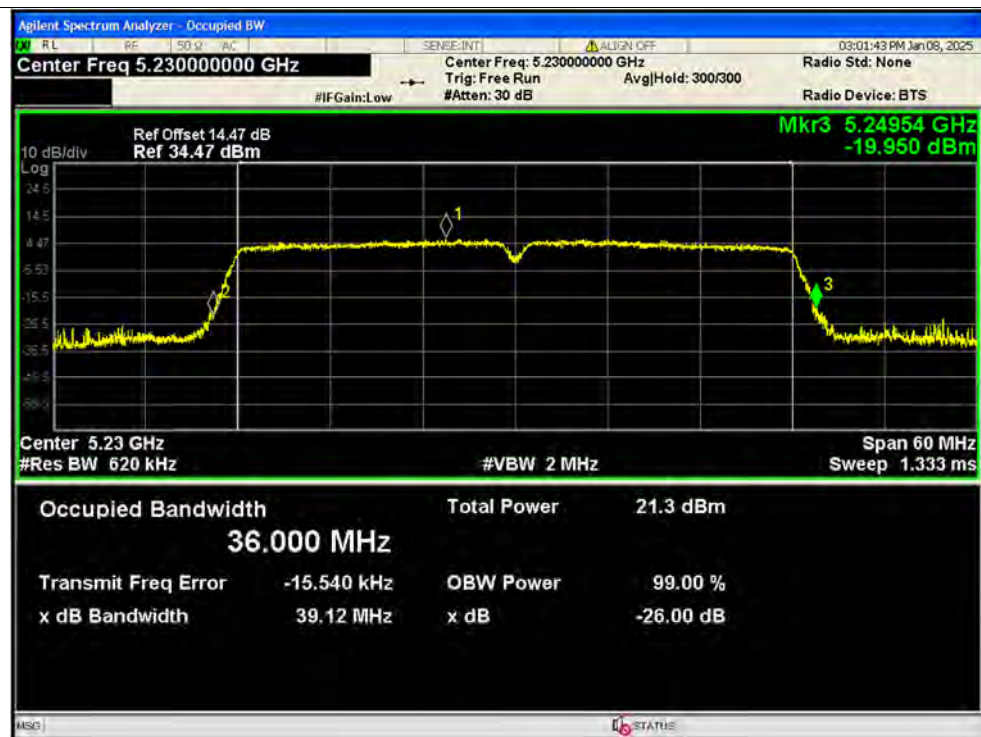




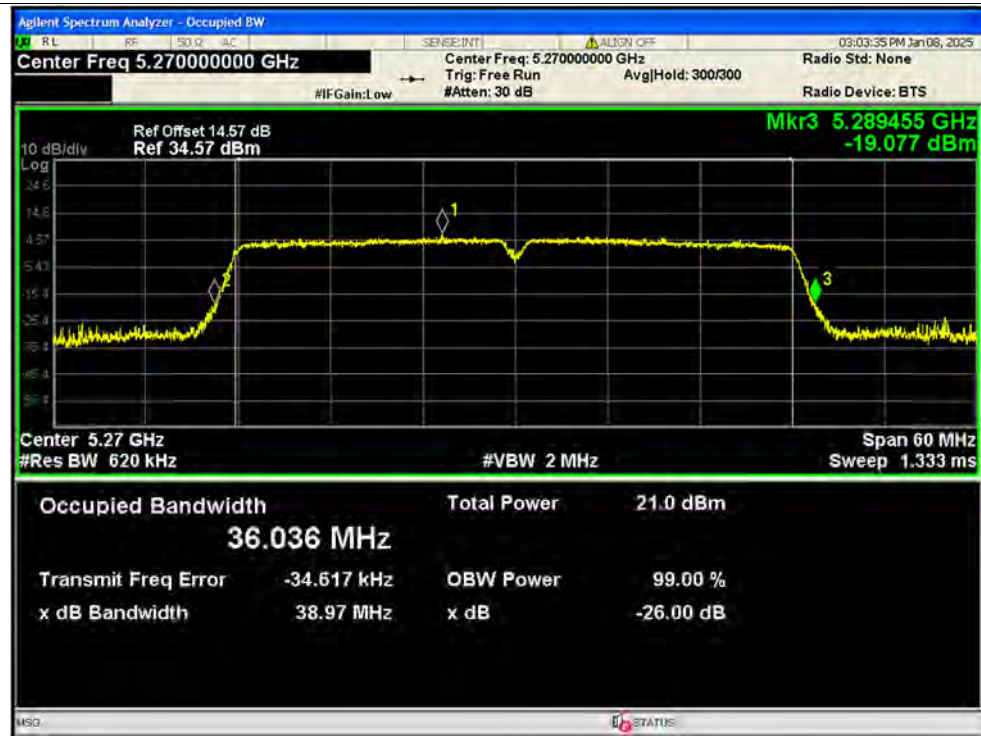
-26dB Bandwidth NVNT n40 5190MHz Ant2 SISO



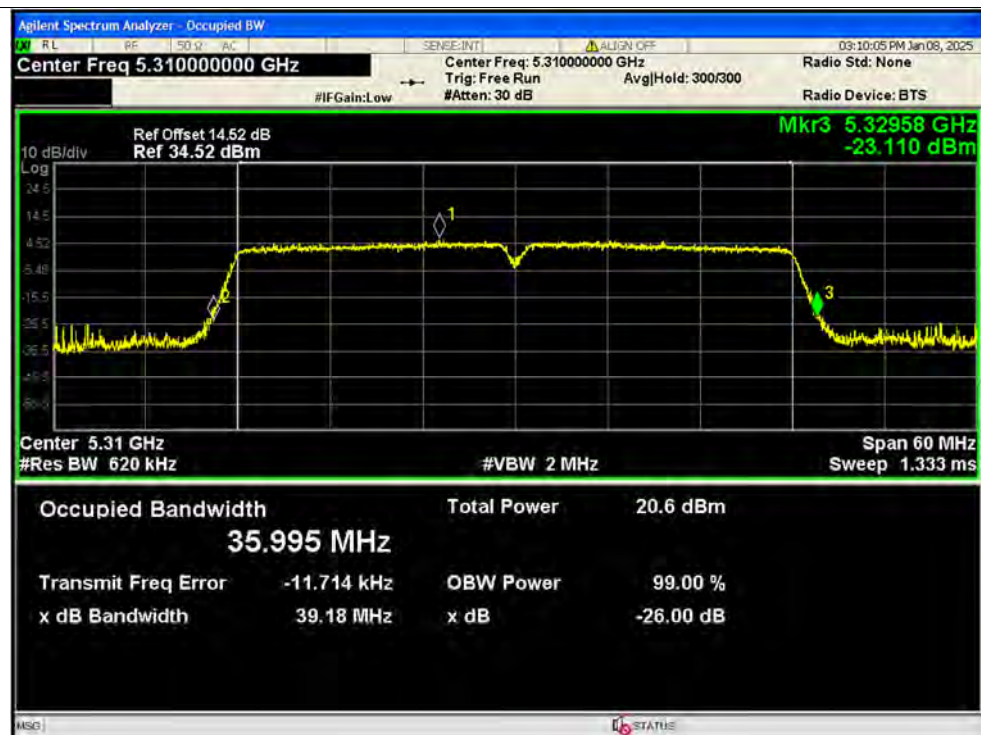
-26dB Bandwidth NVNT n40 5230MHz Ant2 SISO



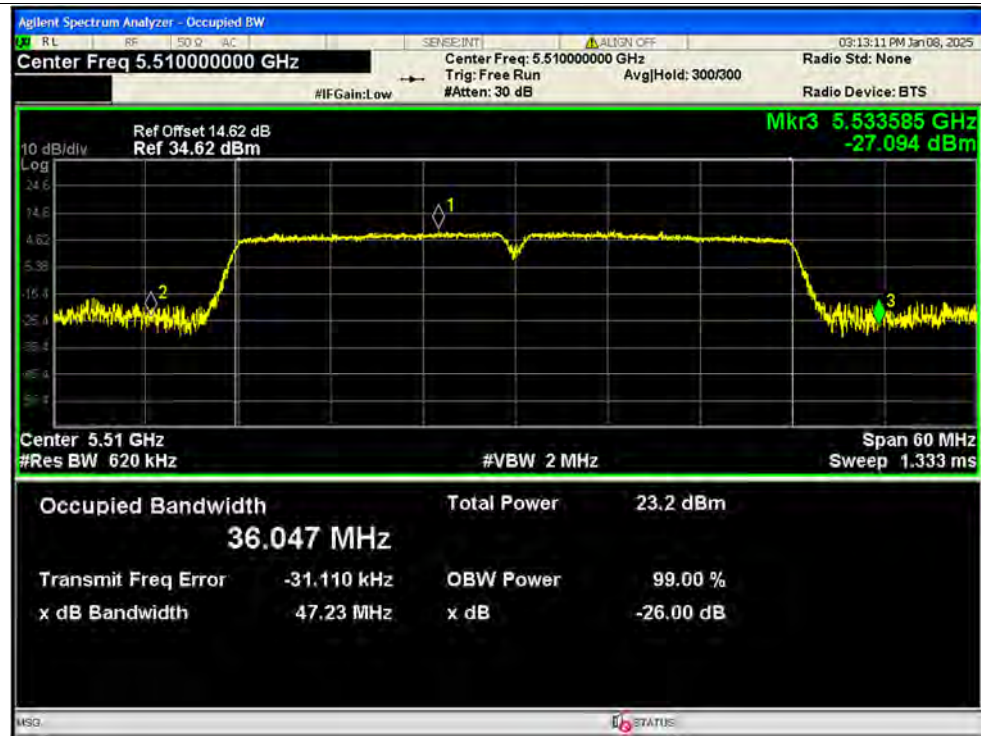
-26dB Bandwidth NVNT n40 5270MHz Ant2 SISO



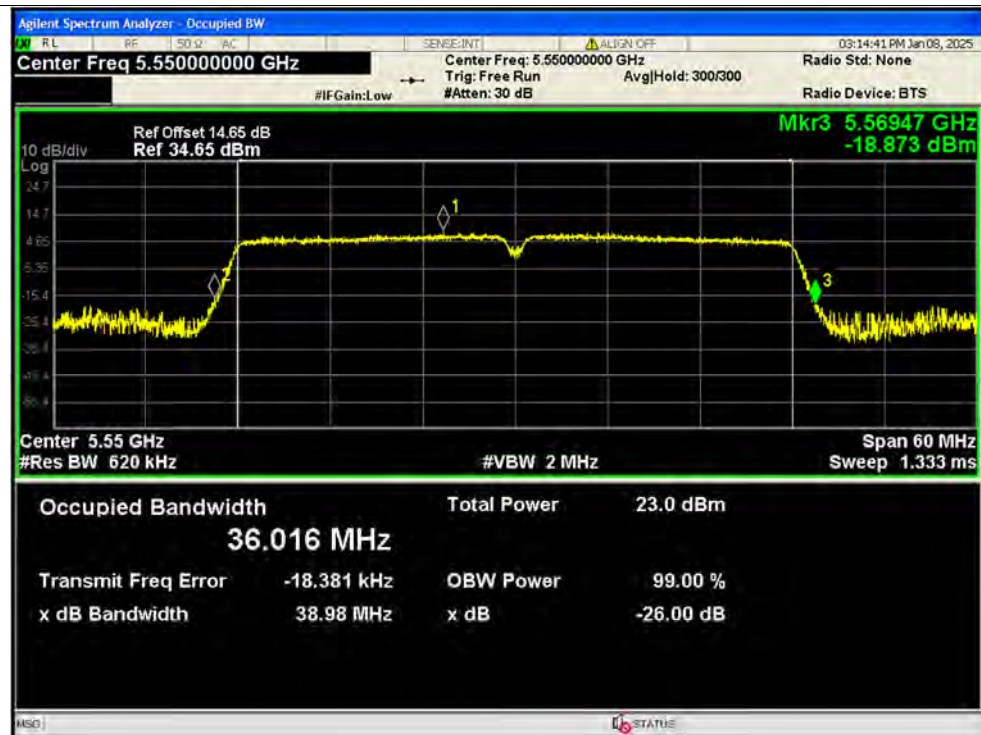
-26dB Bandwidth NVNT n40 5310MHz Ant2 SISO



-26dB Bandwidth NVNT n40 5510MHz Ant2 SISO

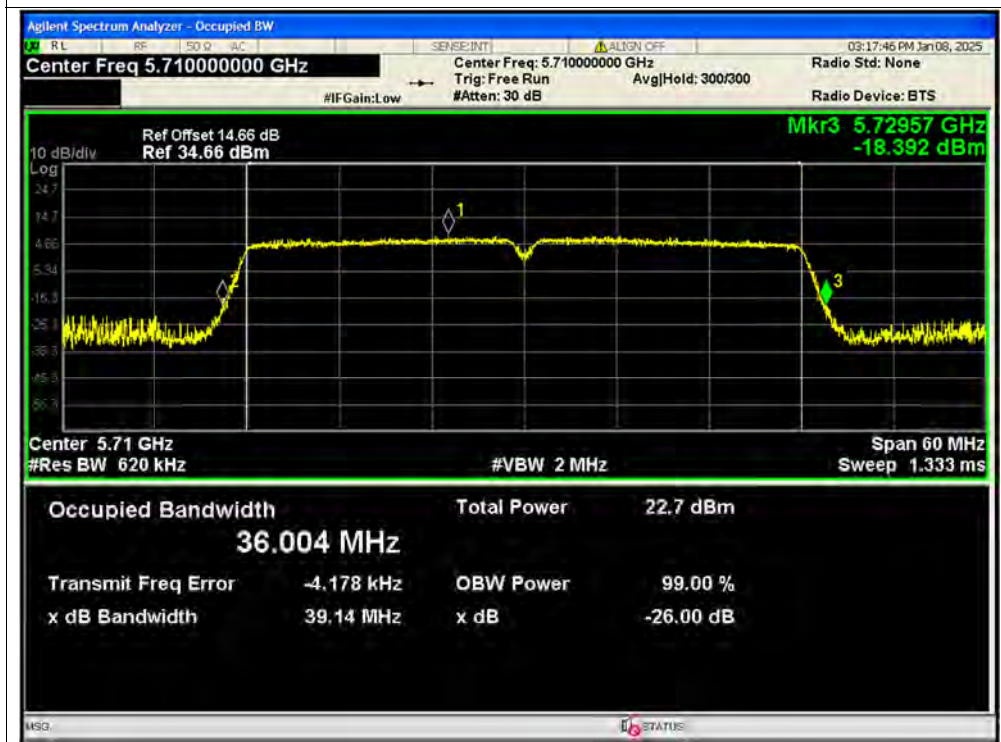


-26dB Bandwidth NVNT n40 5550MHz Ant2 SISO





-26dB Bandwidth NVNT n40 5710MHz Ant2 SISO



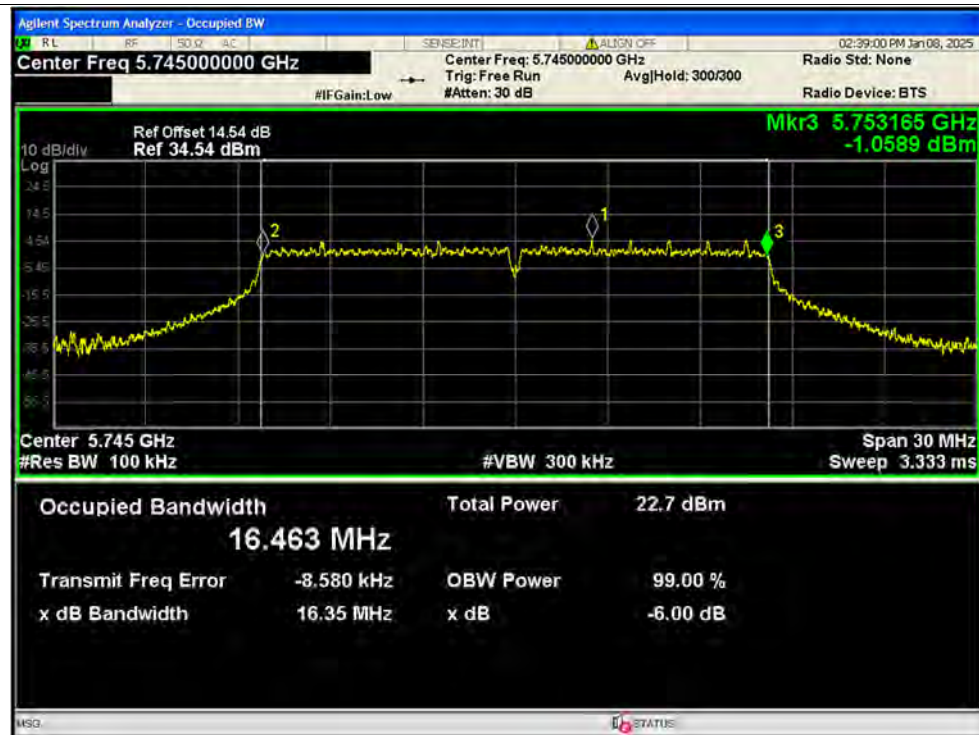
**b) 6dB Bandwidth**

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	a	5745	Ant2	16.35	0.5	Pass
NVNT	a	5785	Ant2	16.35	0.5	Pass
NVNT	a	5825	Ant2	16.35	0.5	Pass
NVNT	n20	5745	Ant2	17.58	0.5	Pass
NVNT	n20	5785	Ant2	17.56	0.5	Pass
NVNT	n20	5825	Ant2	17.57	0.5	Pass
NVNT	n40	5755	Ant2	35.34	0.5	Pass
NVNT	n40	5795	Ant2	35.29	0.5	Pass

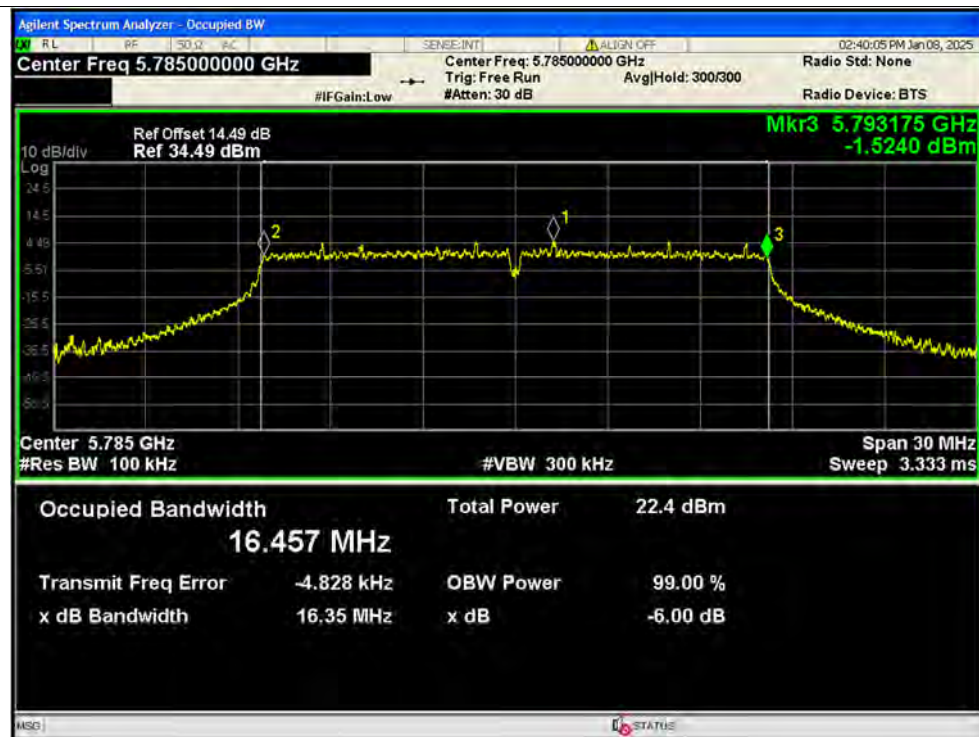


Test Graphs

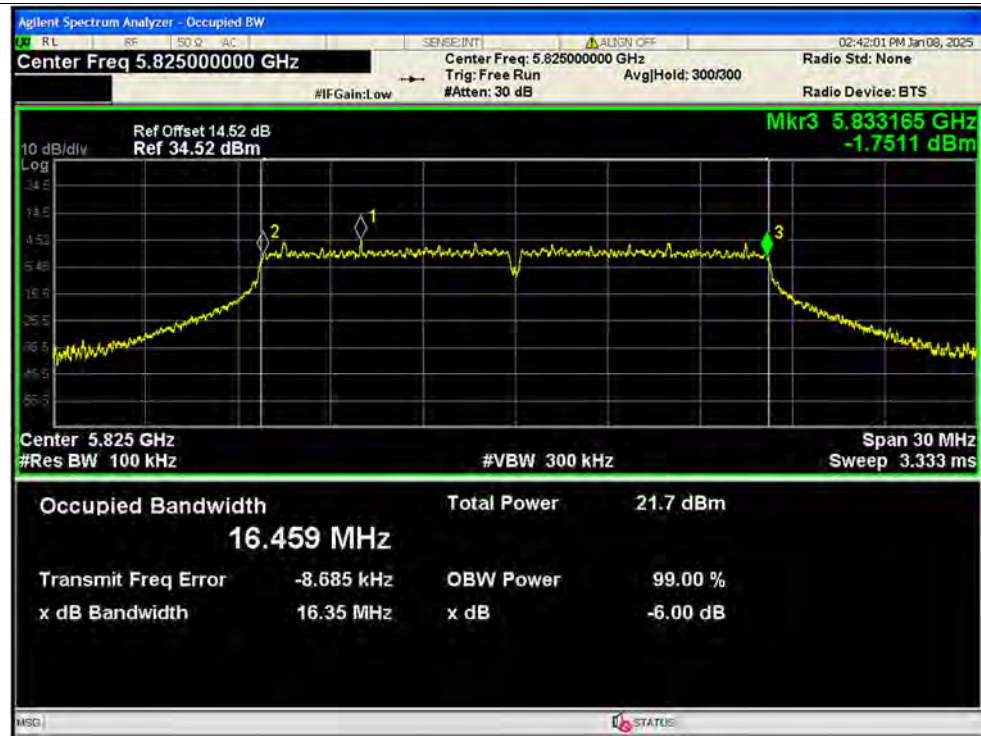
-6dB Bandwidth NVNT a 5745MHz Ant2 SISO



-6dB Bandwidth NVNT a 5785MHz Ant2 SISO



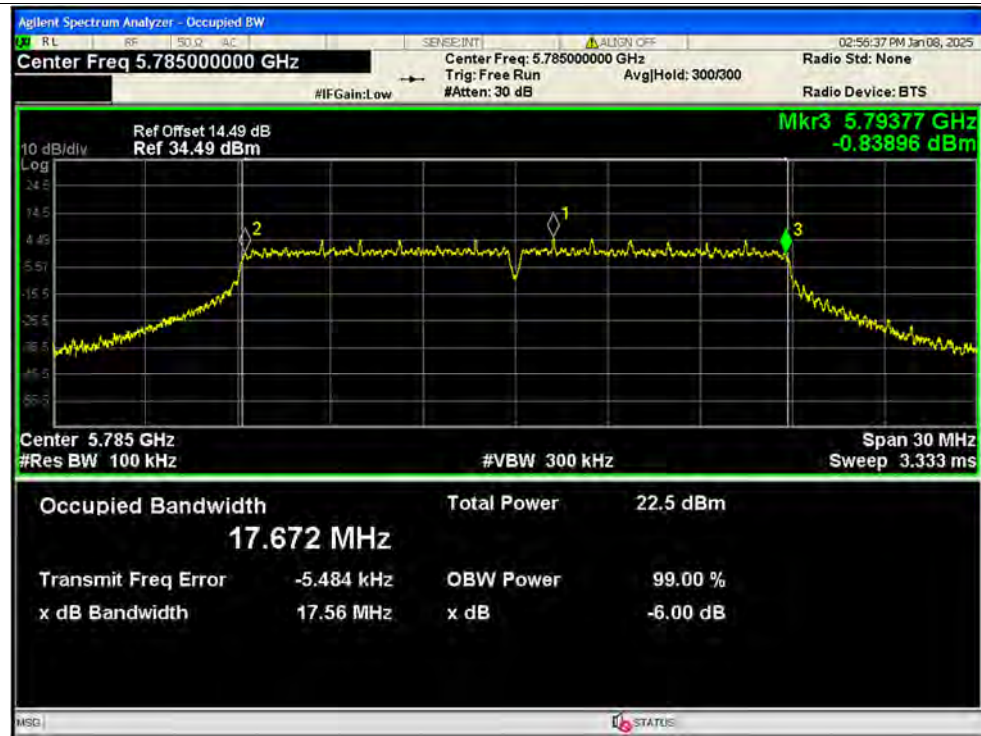
-6dB Bandwidth NVNT a 5825MHz Ant2 SISO



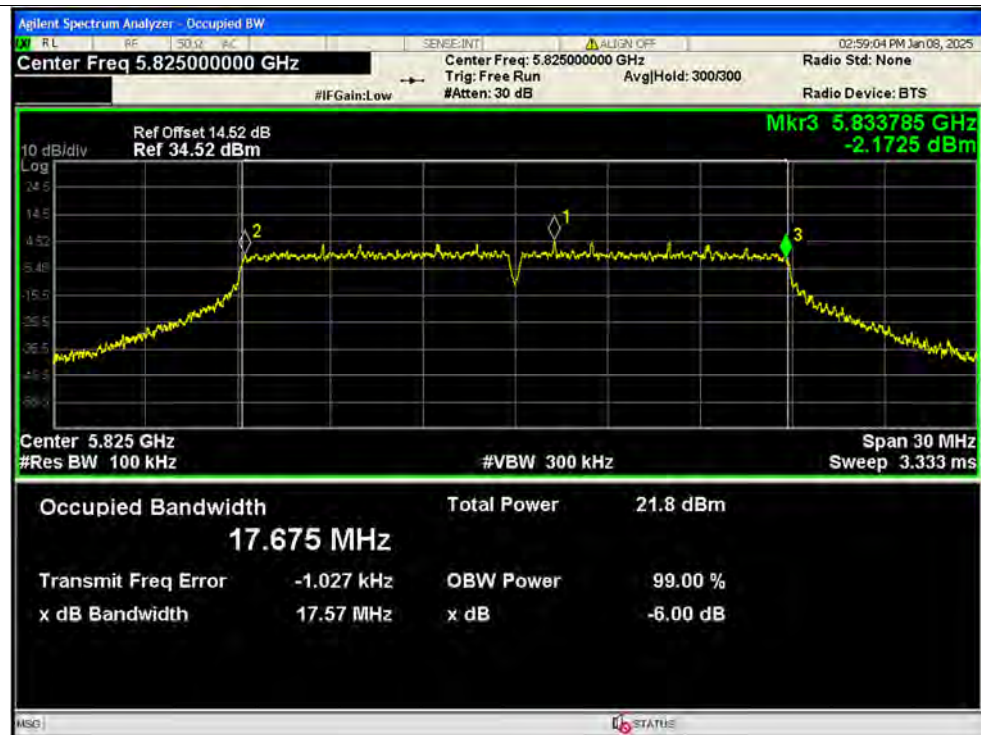
-6dB Bandwidth NVNT n20 5745MHz Ant2 SISO



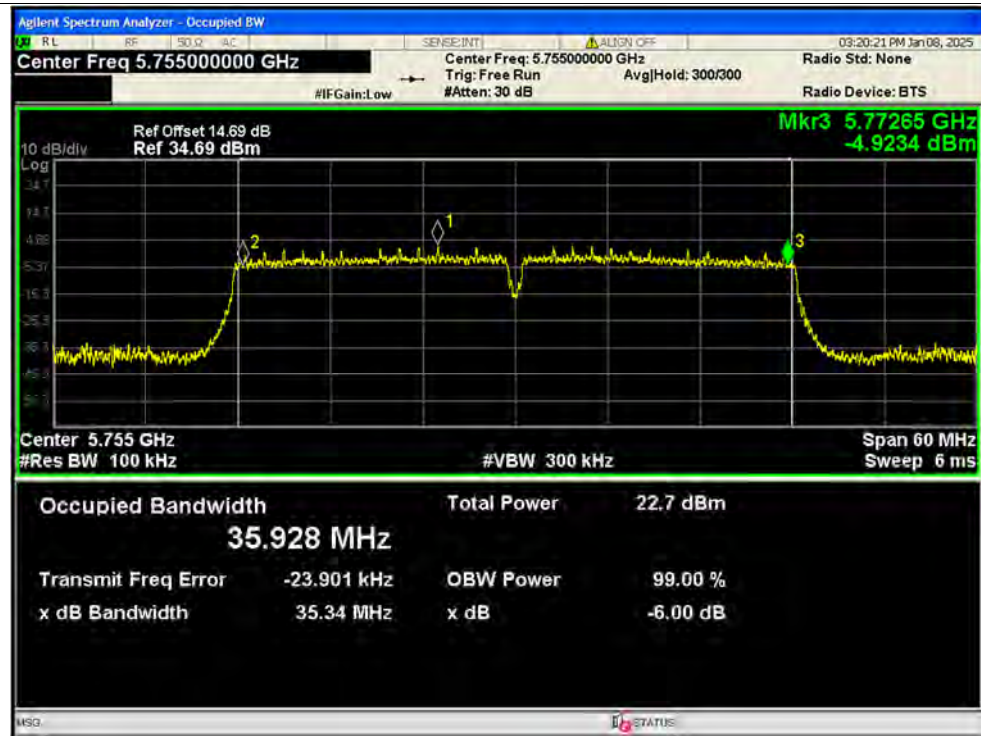
-6dB Bandwidth NVNT n20 5785MHz Ant2 SISO



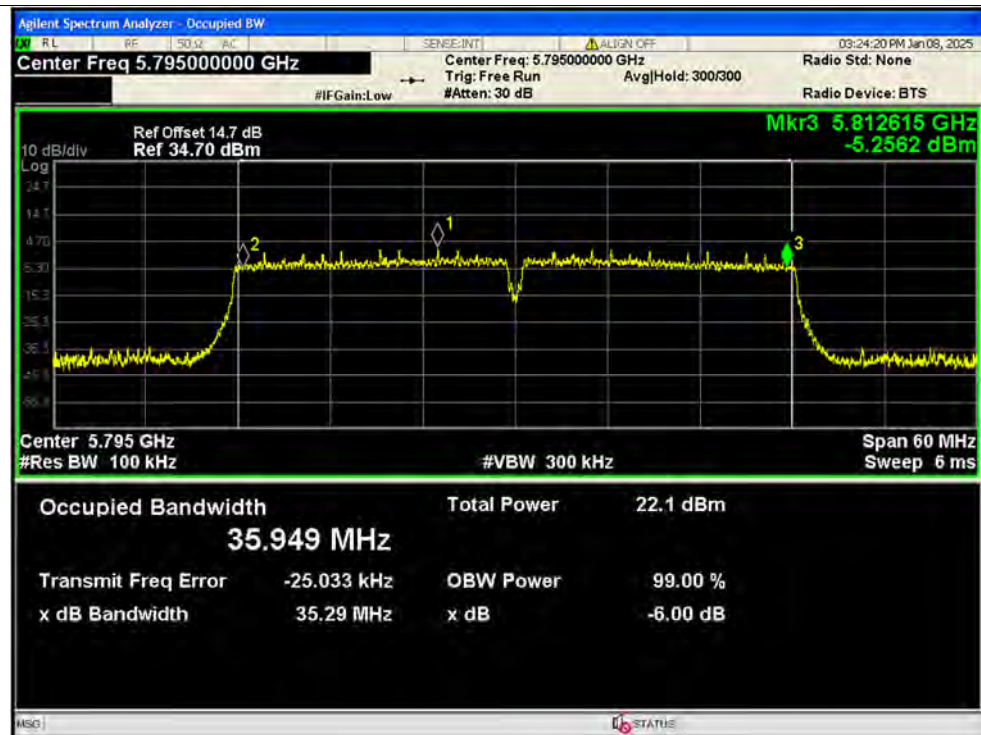
-6dB Bandwidth NVNT n20 5825MHz Ant2 SISO



-6dB Bandwidth NVNT n40 5755MHz Ant2 SISO



-6dB Bandwidth NVNT n40 5795MHz Ant2 SISO



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

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/MHz) (dBm/500kHz @U-NII-3)	Duty Factor (dB)	Total Conducted PSD (dBm/MHz) (dBm/500kHz @ U-NII-3)	Total Conducted PSD (dBm/MHz) (dBm/500kHz @ U-NII-3)	Verdict
NVNT	a	5180	Ant2	2.73	1.76	4.49	11	Pass
NVNT	a	5200	Ant2	2.78	1.75	4.53	11	Pass
NVNT	a	5240	Ant2	2.73	1.75	4.48	11	Pass
NVNT	a	5260	Ant2	2.63	1.74	4.37	11	Pass
NVNT	a	5300	Ant2	2.34	1.74	4.08	11	Pass
NVNT	a	5320	Ant2	2.3	1.74	4.04	11	Pass
NVNT	a	5500	Ant2	4.76	1.74	6.5	11	Pass
NVNT	a	5580	Ant2	4.61	1.74	6.35	11	Pass
NVNT	a	5720	Ant2	3.93	1.75	5.68	11	Pass
NVNT	a	5745	Ant2	1.24	1.75	2.99	30	Pass
NVNT	a	5785	Ant2	0.82	1.76	2.58	30	Pass
NVNT	a	5825	Ant2	-0.05	1.75	1.7	30	Pass
NVNT	n20	5180	Ant2	2.17	1.84	4.01	11	Pass
NVNT	n20	5200	Ant2	2.39	1.84	4.23	11	Pass
NVNT	n20	5240	Ant2	2.21	1.84	4.05	11	Pass
NVNT	n20	5260	Ant2	2.4	1.86	4.26	11	Pass
NVNT	n20	5300	Ant2	2.14	1.84	3.98	11	Pass
NVNT	n20	5320	Ant2	1.78	1.84	3.62	11	Pass
NVNT	n20	5500	Ant2	4.42	1.84	6.26	11	Pass
NVNT	n20	5580	Ant2	3.87	1.84	5.71	11	Pass
NVNT	n20	5720	Ant2	3.7	1.84	5.54	11	Pass
NVNT	n20	5745	Ant2	0.56	1.84	2.4	30	Pass
NVNT	n20	5785	Ant2	0.25	1.84	2.09	30	Pass
NVNT	n20	5825	Ant2	-0.11	1.87	1.76	30	Pass
NVNT	n40	5190	Ant2	-2.24	3.17	0.93	11	Pass
NVNT	n40	5230	Ant2	-2.33	3.22	0.89	11	Pass
NVNT	n40	5270	Ant2	-2.05	3.17	1.12	11	Pass
NVNT	n40	5310	Ant2	-2.96	3.17	0.21	11	Pass
NVNT	n40	5510	Ant2	0.55	3.17	3.72	11	Pass
NVNT	n40	5550	Ant2	-0.44	3.22	2.78	11	Pass
NVNT	n40	5710	Ant2	-0.6	3.22	2.62	11	Pass



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NVNT	n40	5755	Ant2	-3.83	3.17	-0.66	30	Pass
NVNT	n40	5795	Ant2	-3.58	3.17	-0.41	30	Pass

Test Graphs

PSD NVNT a 5180MHz Ant2 SISO



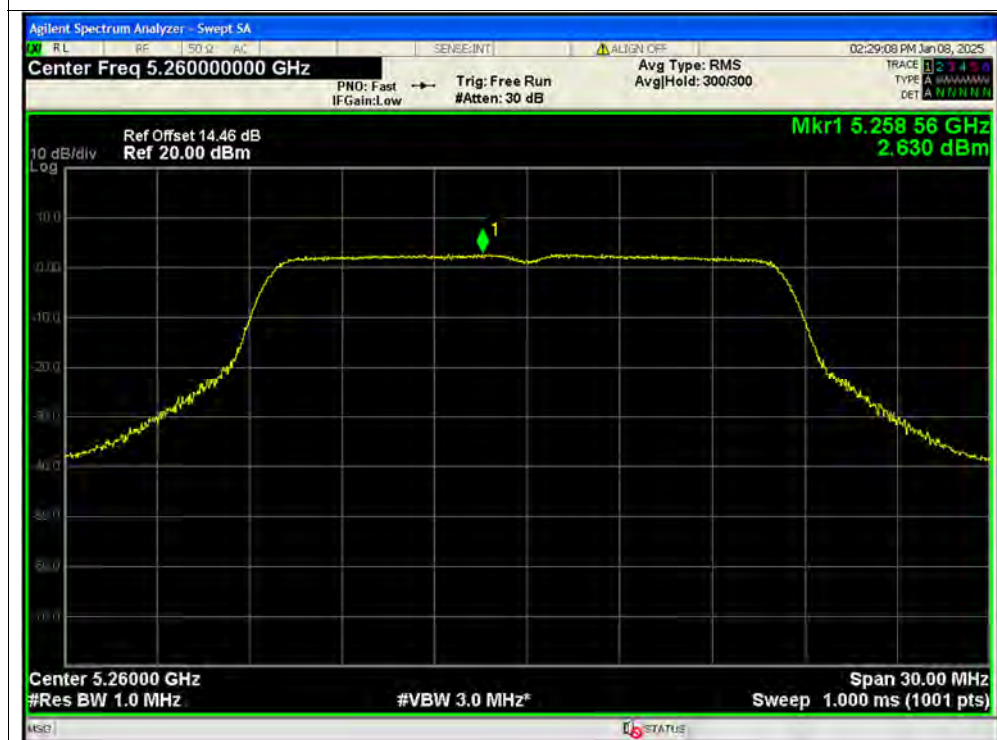
PSD NVNT a 5200MHz Ant2 SISO



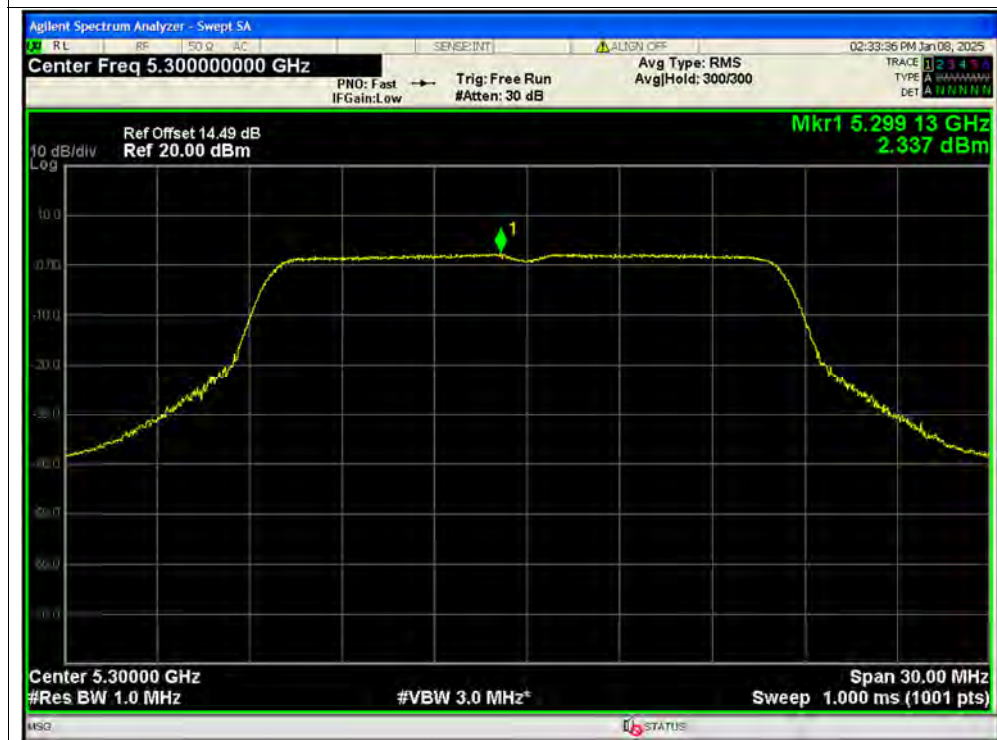
PSD NVNT a 5240MHz Ant2 SISO



PSD NVNT a 5260MHz Ant2 SISO



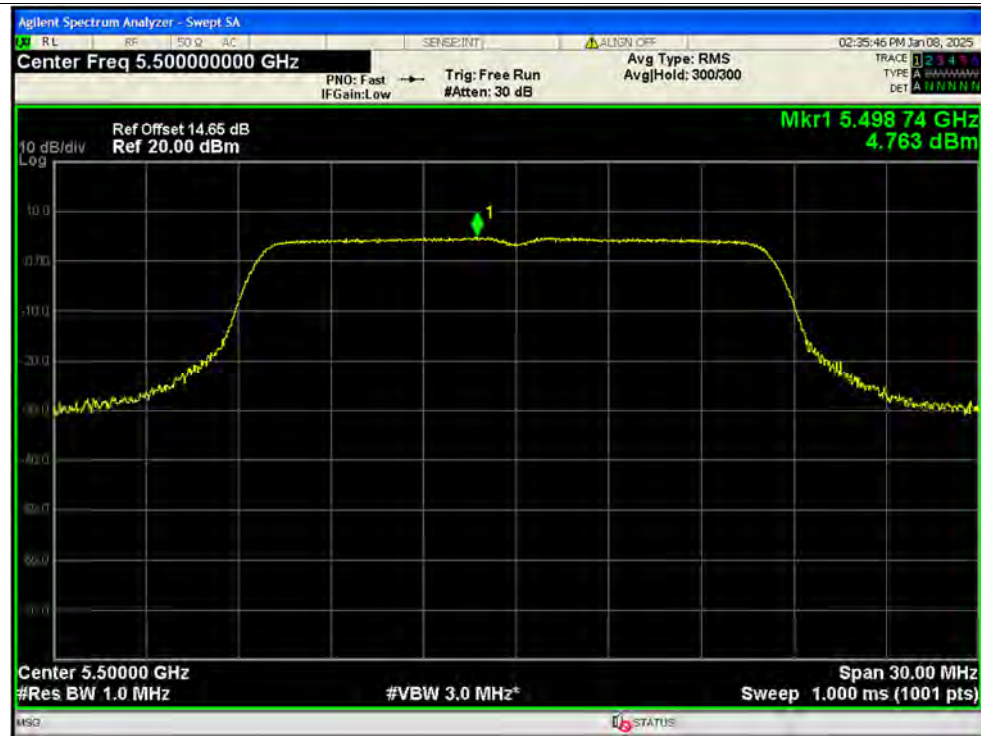
PSD NVNT a 5300MHz Ant2 SISO



PSD NVNT a 5320MHz Ant2 SISO



PSD NVNT a 5500MHz Ant2 SISO



PSD NVNT a 5580MHz Ant2 SISO



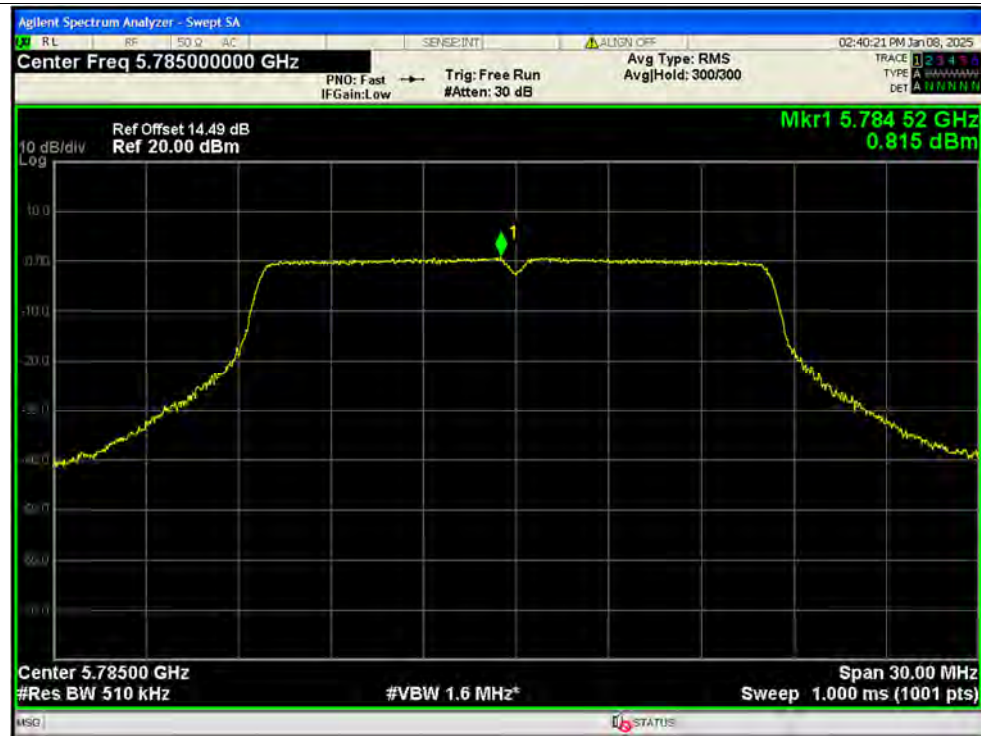
PSD NVNT a 5720MHz Ant2 SISO



PSD NVNT a 5745MHz Ant2 SISO



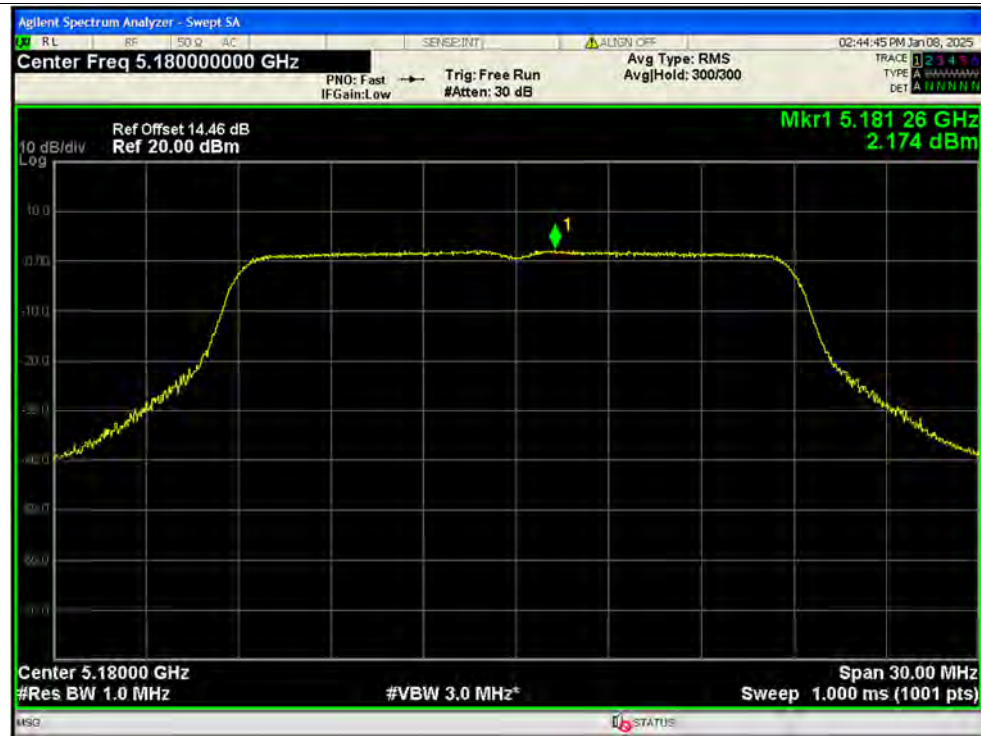
PSD NVNT a 5785MHz Ant2 SISO



PSD NVNT a 5825MHz Ant2 SISO



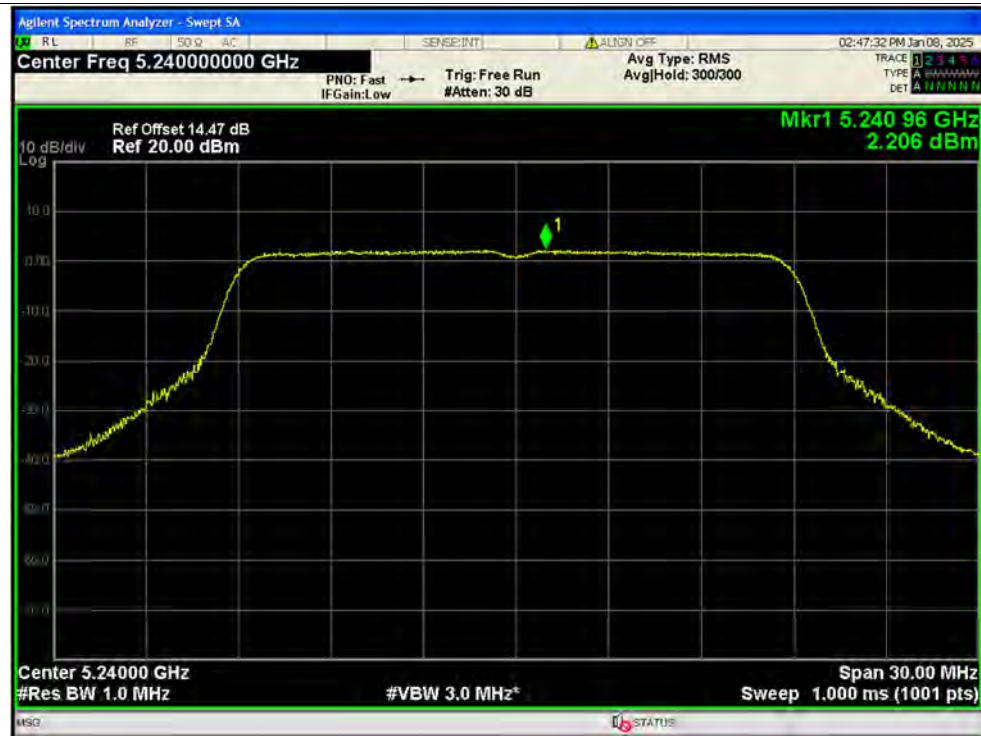
PSD NVNT n20 5180MHz Ant2 SISO



PSD NVNT n20 5200MHz Ant2 SISO



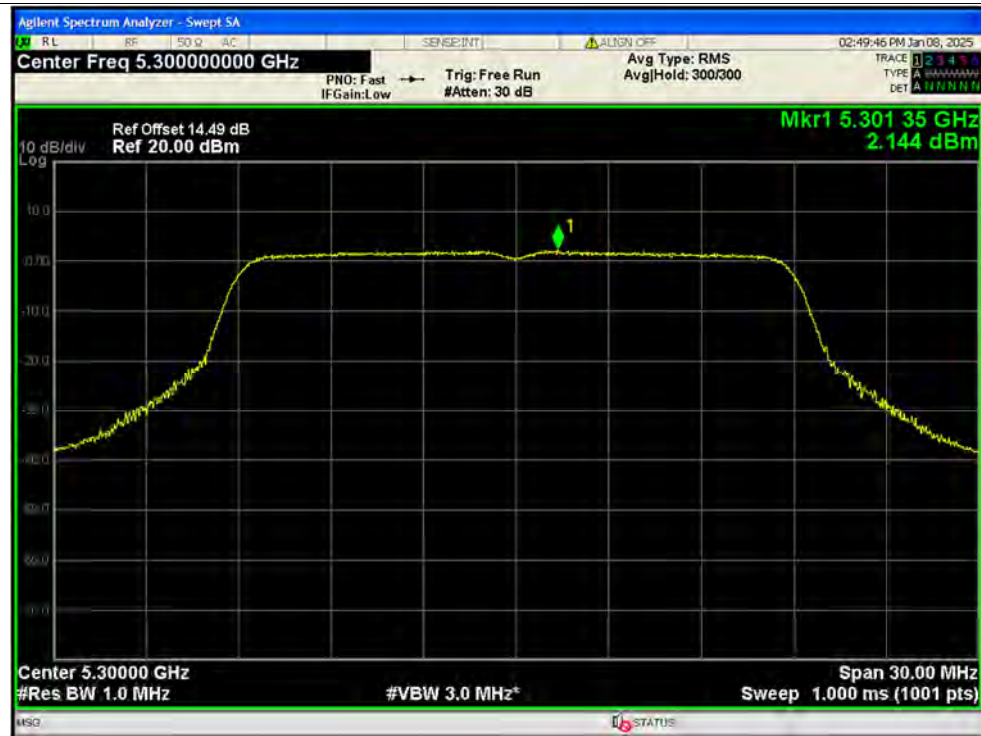
PSD NVNT n20 5240MHz Ant2 SISO



PSD NVNT n20 5260MHz Ant2 SISO



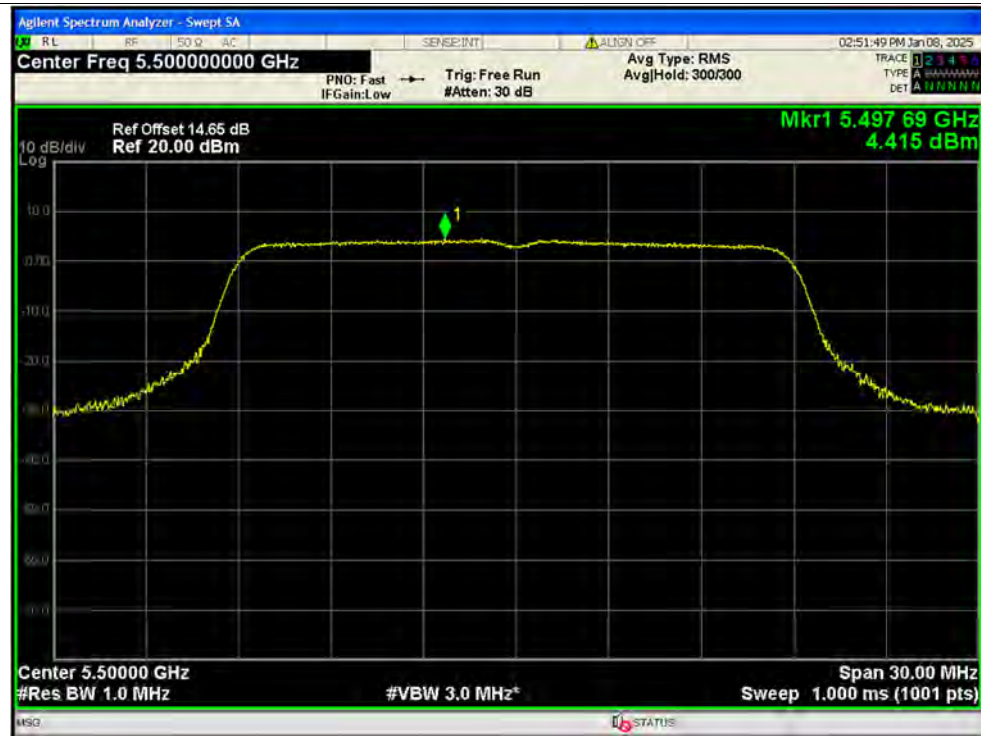
PSD NVNT n20 5300MHz Ant2 SISO



PSD NVNT n20 5320MHz Ant2 SISO



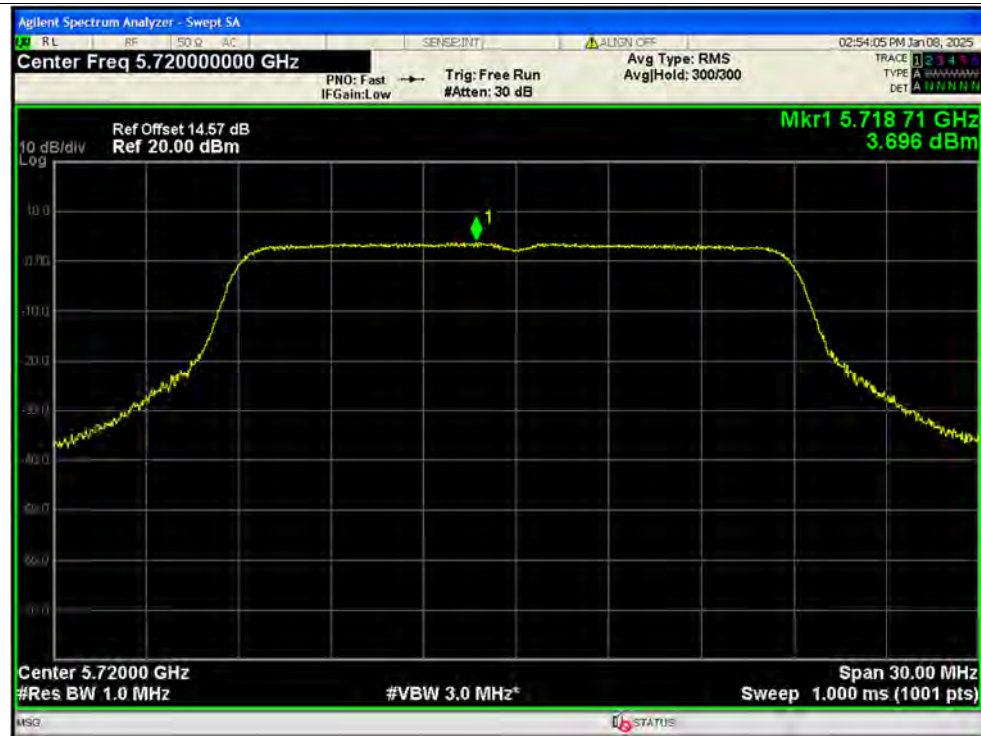
PSD NVNT n20 5500MHz Ant2 SISO



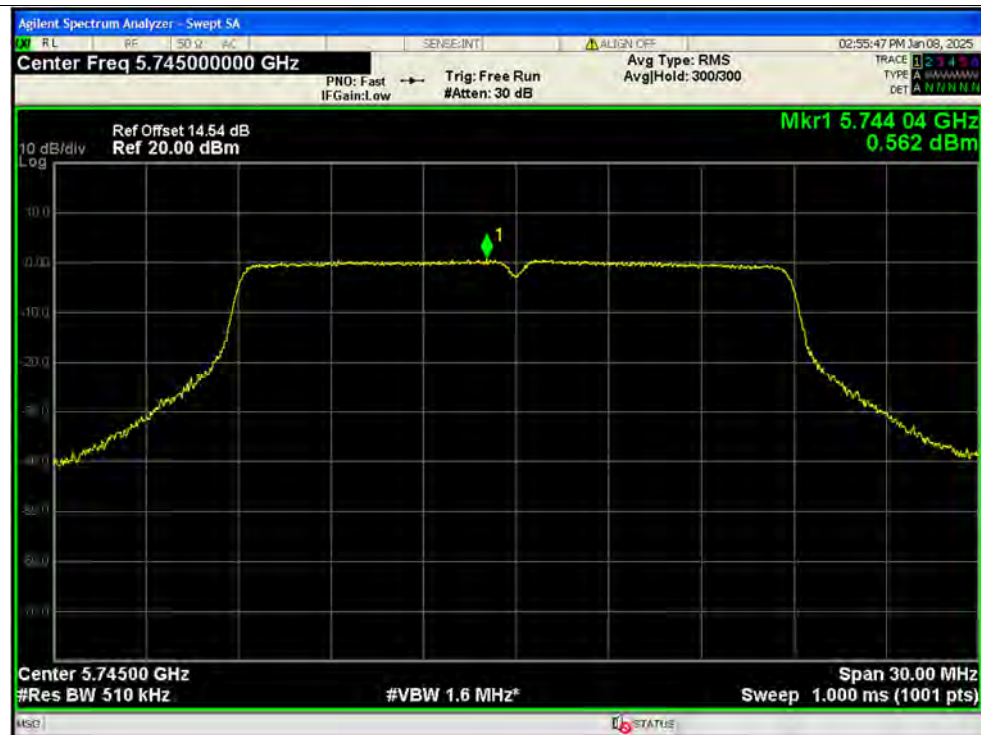
PSD NVNT n20 5580MHz Ant2 SISO



PSD NVNT n20 5720MHz Ant2 SISO

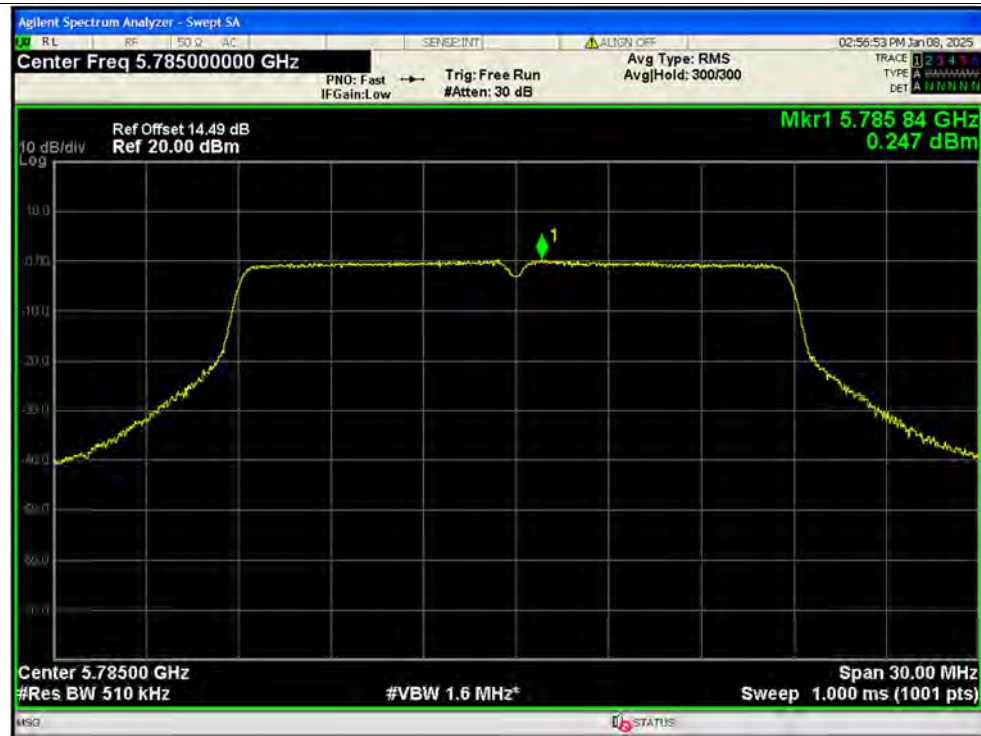


PSD NVNT n20 5745MHz Ant2 SISO





PSD NVNT n20 5785MHz Ant2 SISO



PSD NVNT n20 5825MHz Ant2 SISO



PSD NVNT n40 5190MHz Ant2 SISO



PSD NVNT n40 5230MHz Ant2 SISO



PSD NVNT n40 5270MHz Ant2 SISO

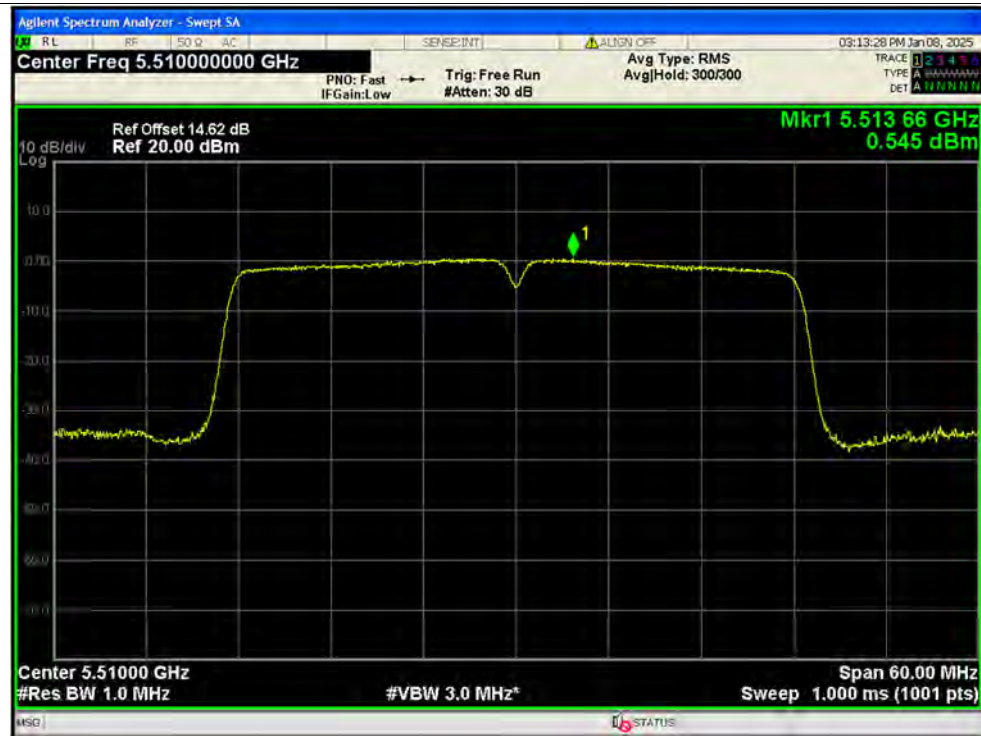


PSD NVNT n40 5310MHz Ant2 SISO





PSD NVNT n40 5510MHz Ant2 SISO



PSD NVNT n40 5550MHz Ant2 SISO



PSD NVNT n40 5710MHz Ant2 SISO

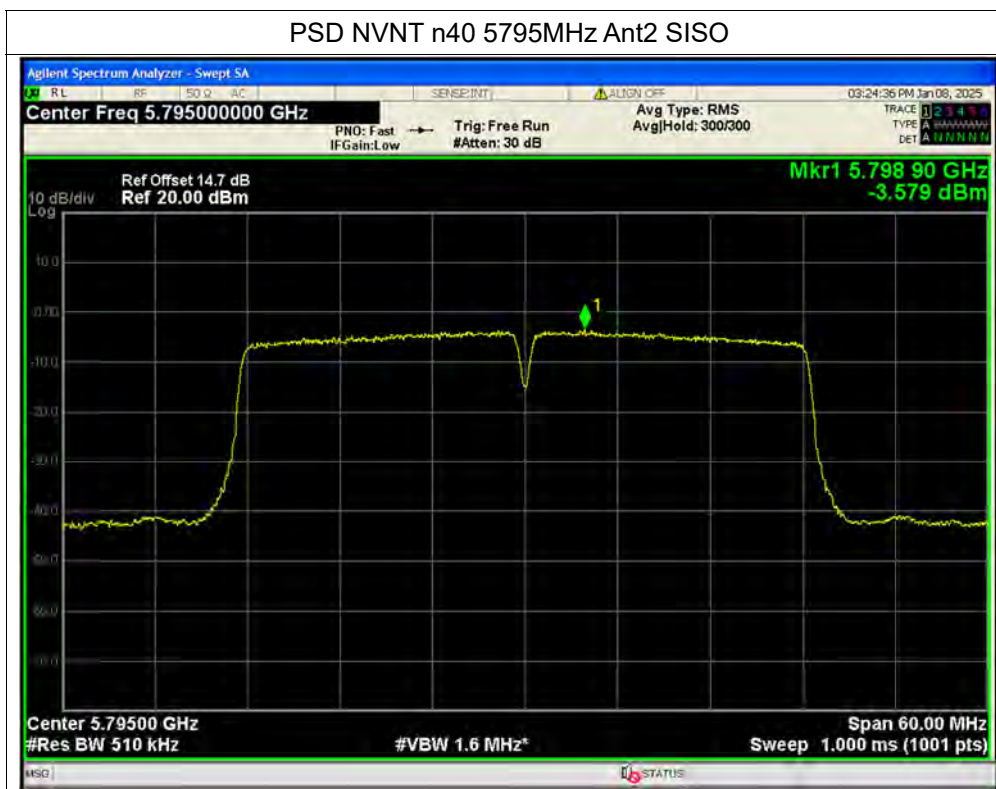


PSD NVNT n40 5755MHz Ant2 SISO





PSD NVNT n40 5795MHz Ant2 SISO



**A.5. Frequency Stability**

Condition	Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
20C 5V	CW	5180	Ant2	5180	0	0	25	Pass
20C 22V	CW	5180	Ant2	5180	0	0	25	Pass
20C 30V	CW	5180	Ant2	5180	0	0	25	Pass
0C 22V	CW	5180	Ant2	5180	0	0	25	Pass
10C 22V	CW	5180	Ant2	5180	0	0	25	Pass
30C 22V	CW	5180	Ant2	5180	0	0	25	Pass
35C 22V	CW	5180	Ant2	5180	0	0	25	Pass
20C 5V	CW	5260	Ant2	5260	0	0	25	Pass
20C 22V	CW	5260	Ant2	5260	0	0	25	Pass
20C 30V	CW	5260	Ant2	5260	0	0	25	Pass
0C 22V	CW	5260	Ant2	5260	0	0	25	Pass
10C 22V	CW	5260	Ant2	5260	0	0	25	Pass
30C 22V	CW	5260	Ant2	5260	0	0	25	Pass
35C 22V	CW	5260	Ant2	5260	0	0	25	Pass
20C 5V	CW	5500	Ant2	5500	0	0	25	Pass
20C 22V	CW	5500	Ant2	5500	0	0	25	Pass
20C 30V	CW	5500	Ant2	5500	0	0	25	Pass
0C 22V	CW	5500	Ant2	5500	0	0	25	Pass
10C 22V	CW	5500	Ant2	5500	0	0	25	Pass
30C 22V	CW	5500	Ant2	5500	0	0	25	Pass
35C 22V	CW	5500	Ant2	5500	0	0	25	Pass
20C 5V	CW	5745	Ant2	5745	0	0	25	Pass
20C 22V	CW	5745	Ant2	5745	0	0	25	Pass
20C 30V	CW	5745	Ant2	5745	0	0	25	Pass
0C 22V	CW	5745	Ant2	5745	0	0	25	Pass
10C 22V	CW	5745	Ant2	5745	0	0	25	Pass
30C 22V	CW	5745	Ant2	5745	0	0	25	Pass
35C 22V	CW	5745	Ant2	5745	0	0	25	Pass



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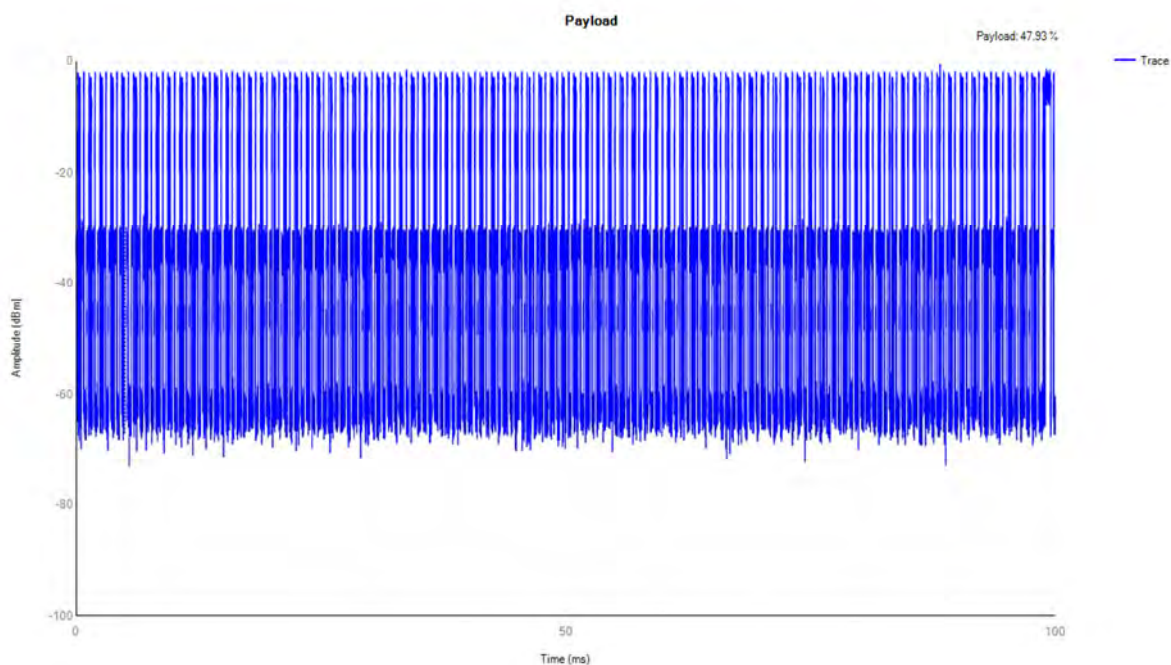
A.6. Dynamic Frequency Selection

a) Payload

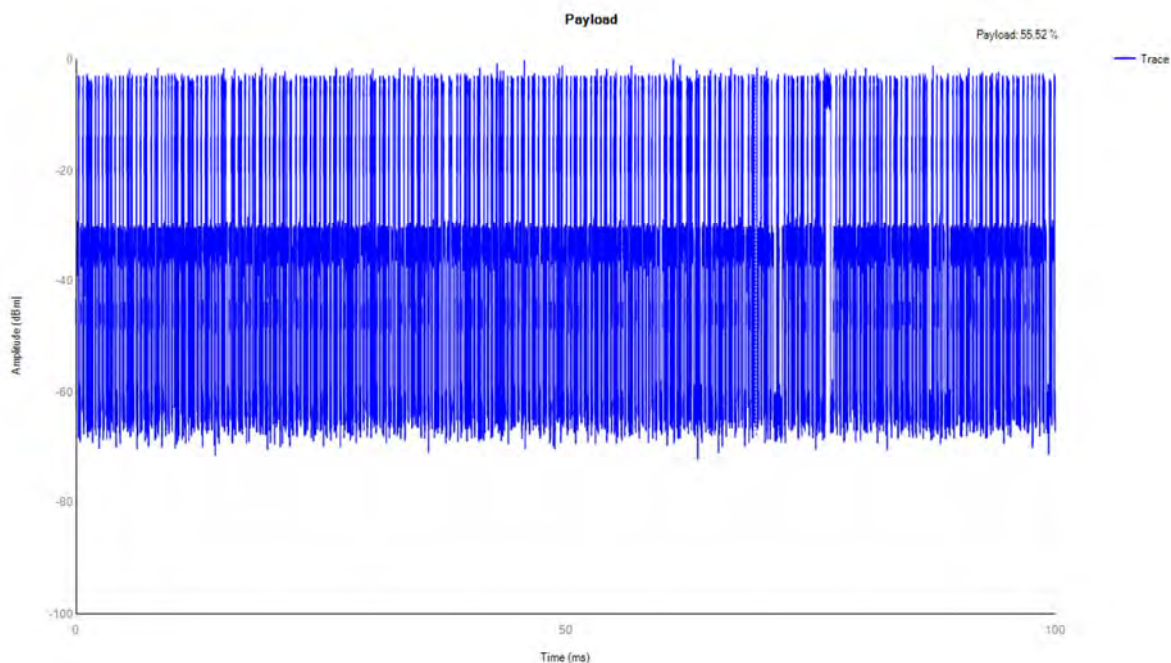
Mode	Frequency (MHz)	Result	Verdict
n20	5260	47.93	Pass
n20	5500	55.52	Pass
n40	5270	39.86	Pass
n40	5510	41.06	Pass

Test Graphs

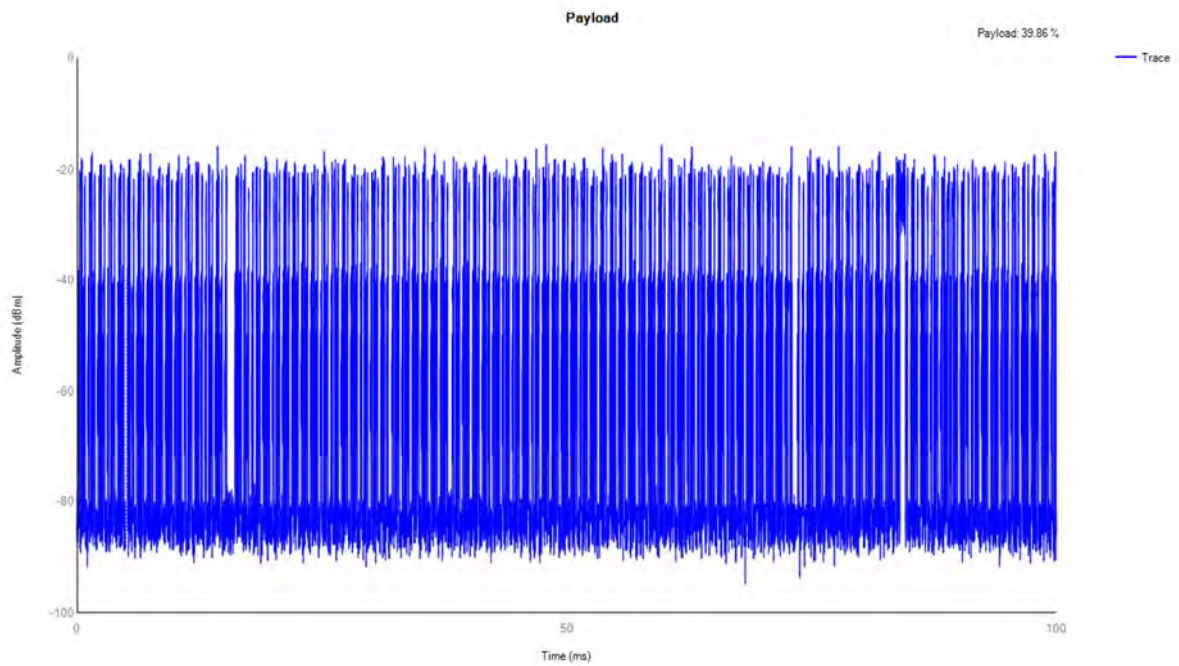
n20 5260MHz Payload



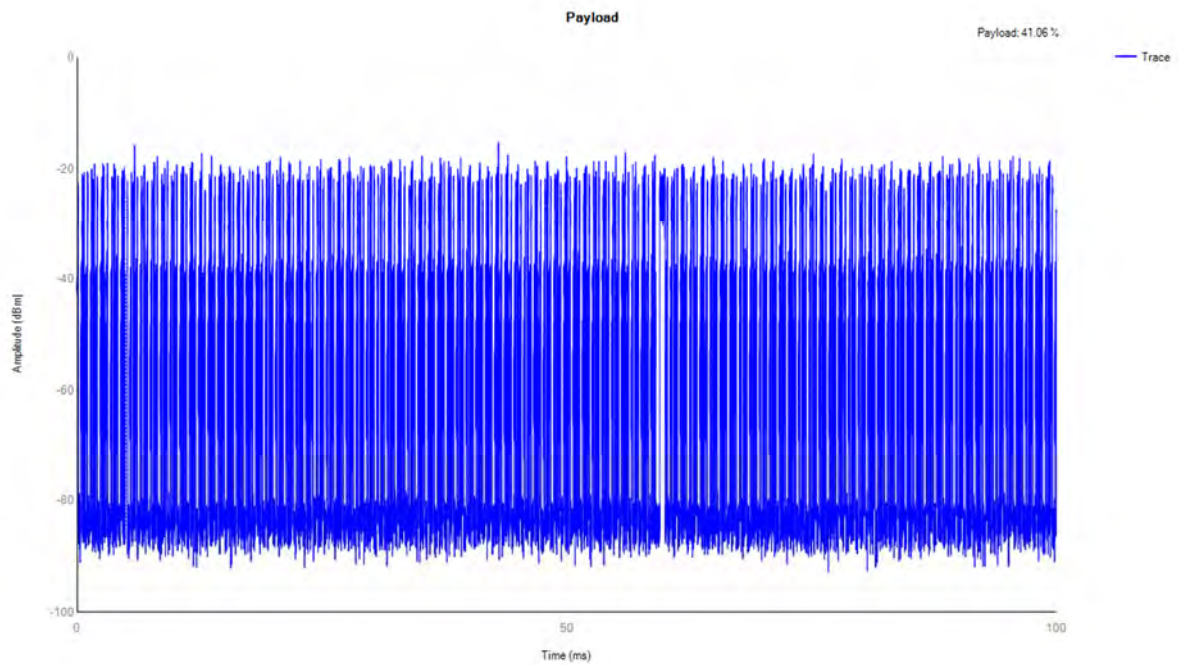
n20 5500MHz Payload



n40 5270MHz Payload



n40 5510MHz Payload



**b) Detection Thresholds**

Mode	Frequency (MHz)	Type	Result	Verdict
n20	5260	DFS_FCC_T0	See test Graph	Pass
n20	5500	DFS_FCC_T0	See test Graph	Pass
n40	5270	DFS_FCC_T0	See test Graph	Pass
n40	5510	DFS_FCC_T0	See test Graph	Pass

Spectrum analyzer settings:

Span: Zero

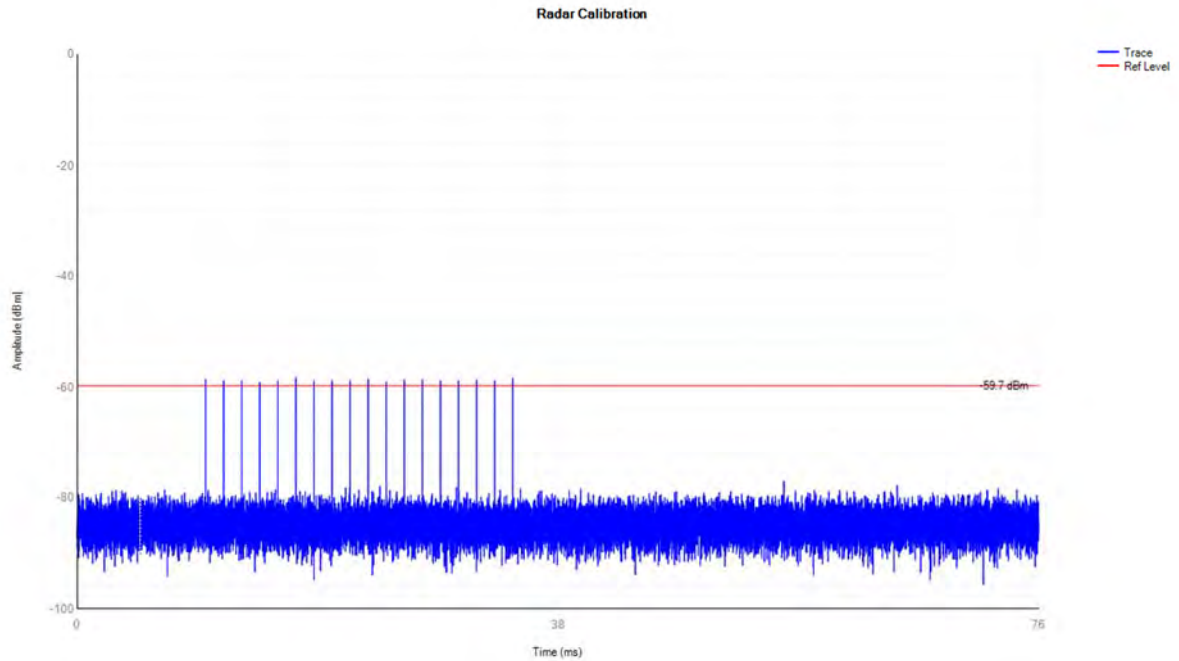
Detector Type: Peak

RBW: 3MHz

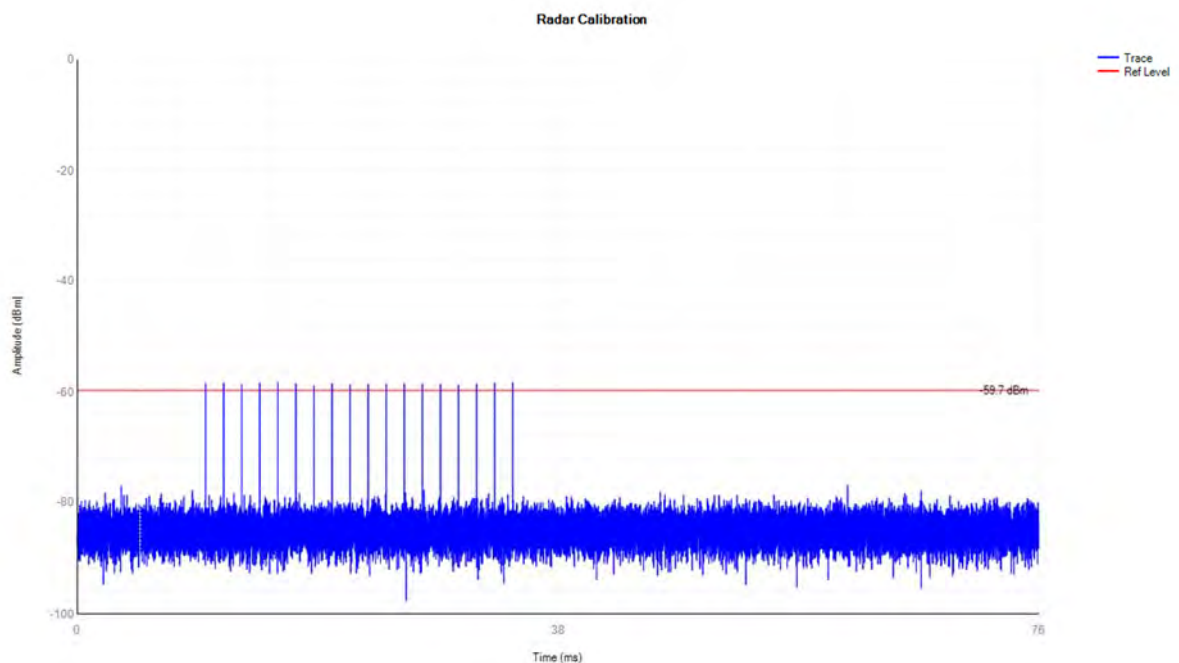
VBW: 3MHz

Test Graphs

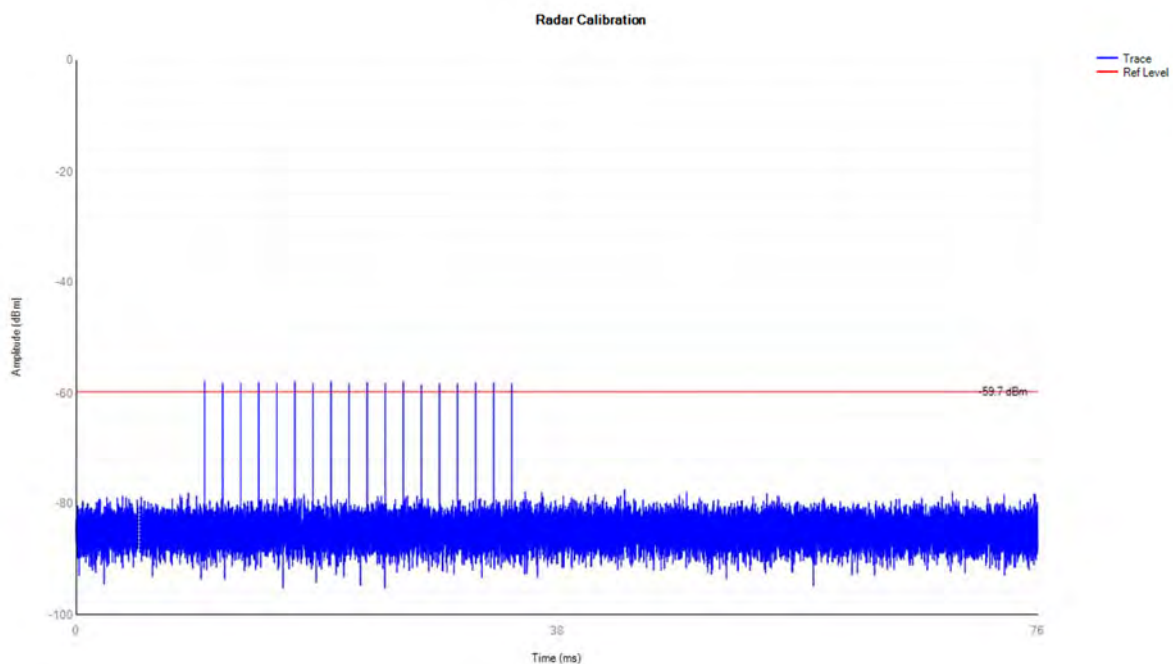
5260MHz DFS_FCC_T0



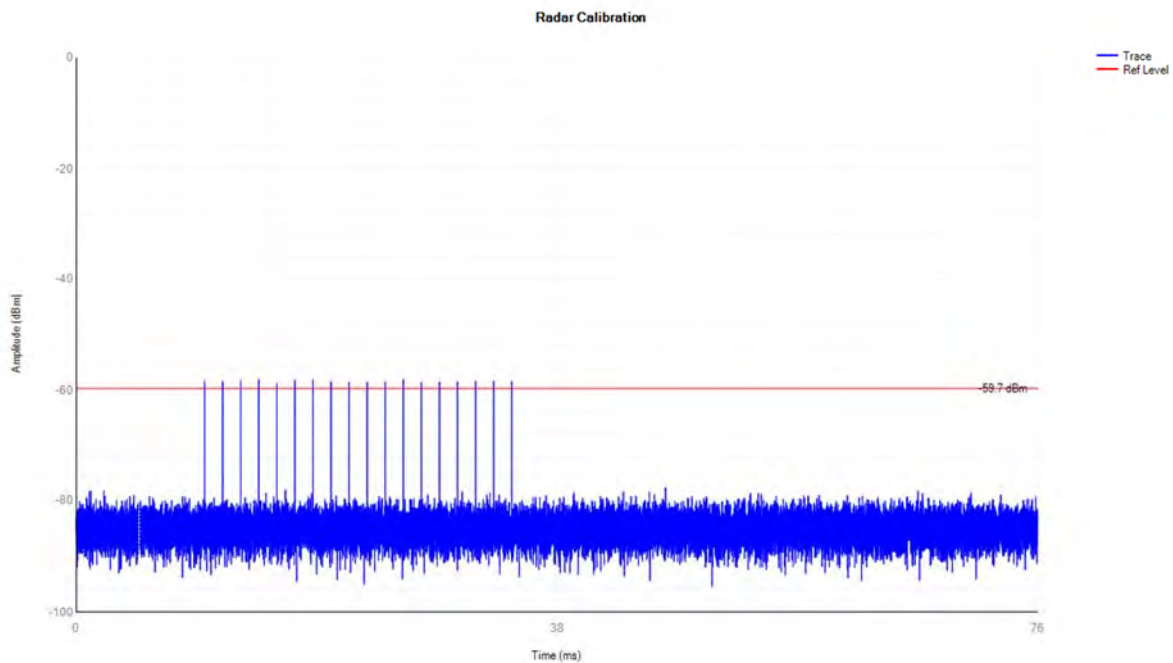
5500MHz DFS_FCC_T0



5270MHz DFS_FCC_T0



5510MHz DFS_FCC_T0





c) 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
n20	5260	0.821	10	0.017	0.26	0.011	0.06	Pass
n20	5500	0.739	10	0.013	0.26	0.008	0.06	Pass
n40	5270	0.856	10	0.015	0.26	0.011	0.06	Pass
n40	5510	0.855	10	0.014	0.26	0.011	0.06	Pass

Spectrum analyzer settings:

Span: Zero

Detector type: Peak

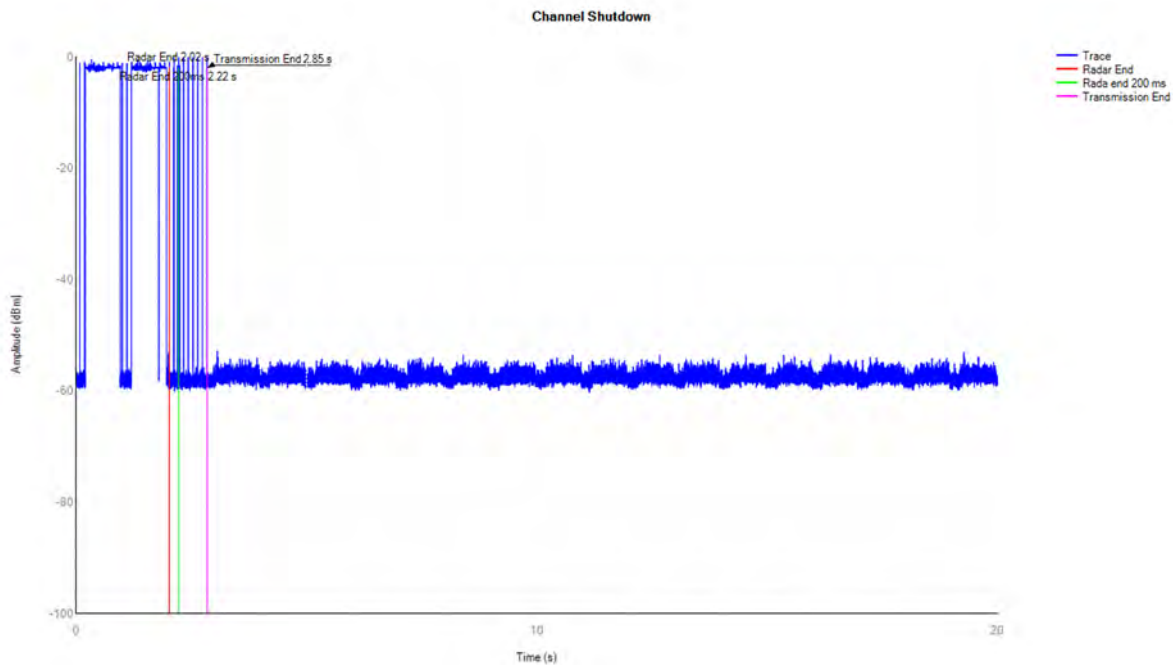
RBW: 3MHz

VBW: 3MHz

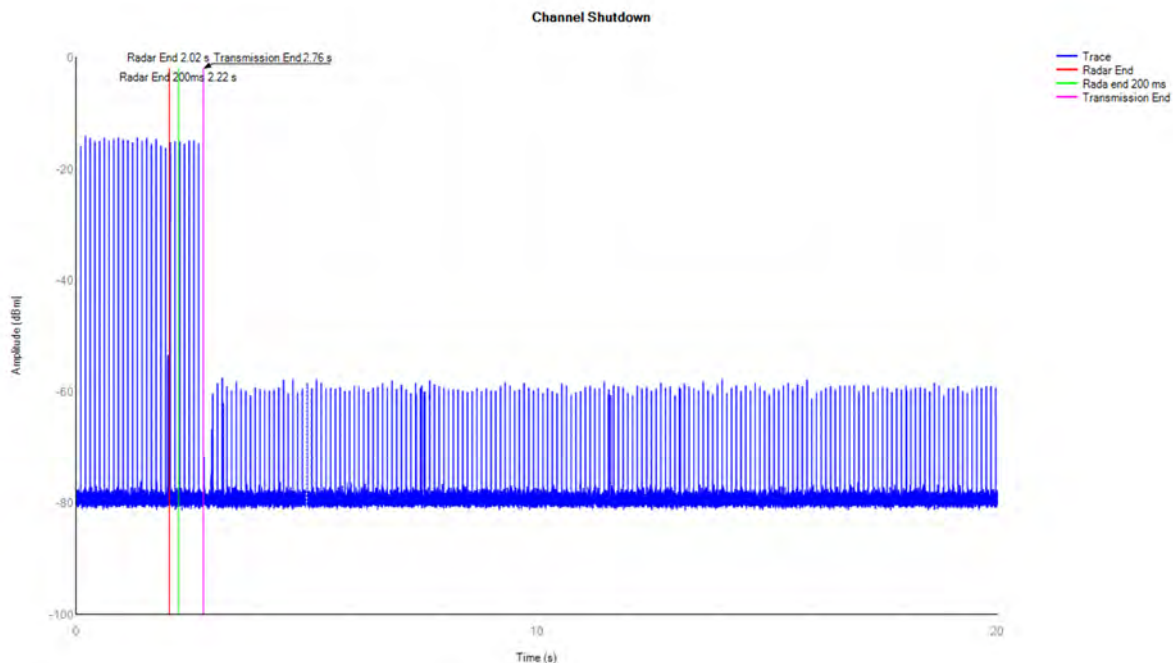
Sweep time: 20s

Test Graphs

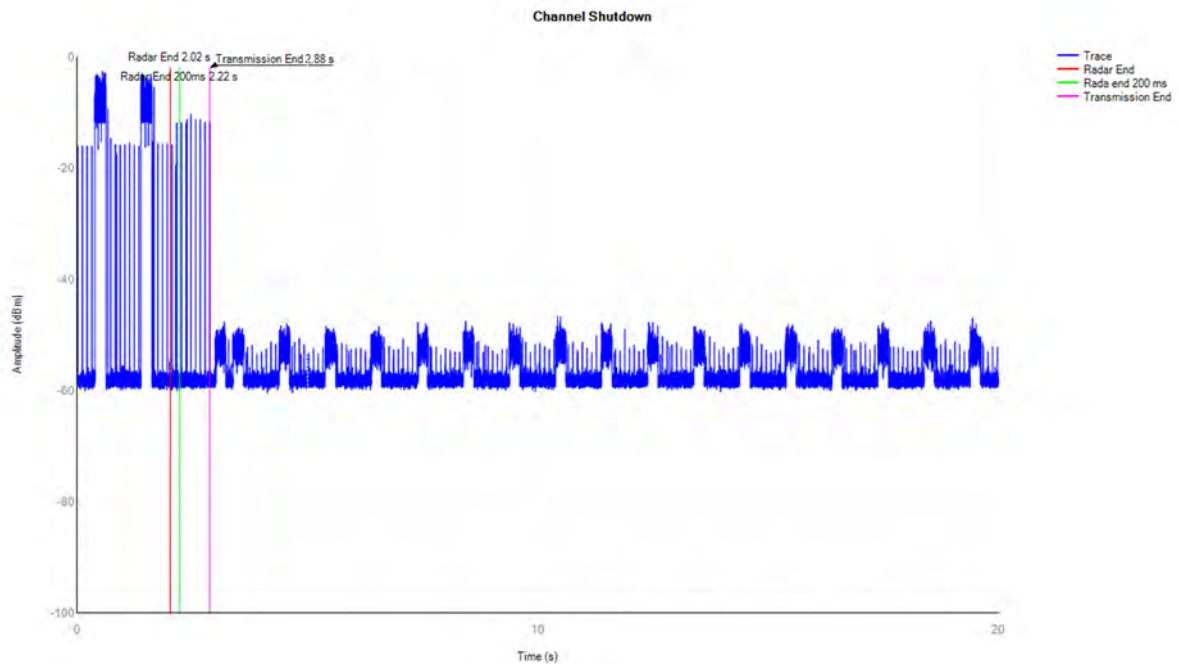
n20 5260MHz Shutdown



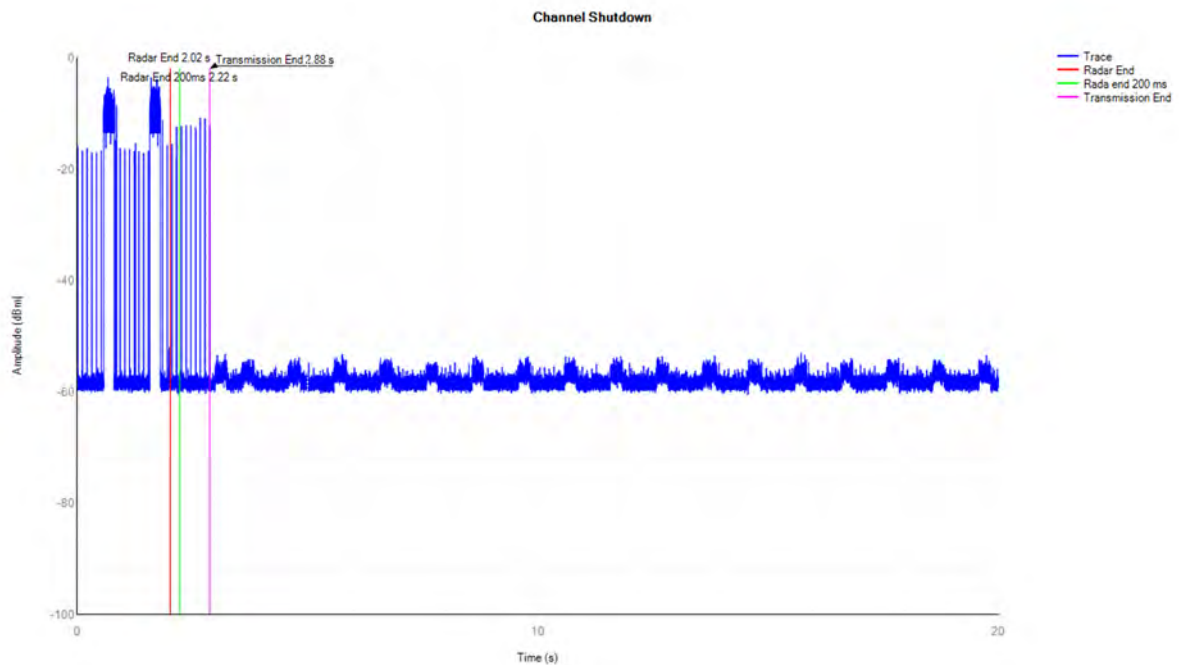
n20 5500MHz Shutdown



n40 5270MHz Shutdown



n40 5510MHz Shutdown



Note: The signal above the noise floor after the radar signal ends is the signal which leaked from other channels that have been moved following the Master device.

**d) Non-Occupancy Period**

Mode	Frequency (MHz)	Result	Verdict
n20	5260	See test Graph	Pass
n20	5500	See test Graph	Pass

Spectrum analyzer settings:

Span: Zero

Detector type: Peak

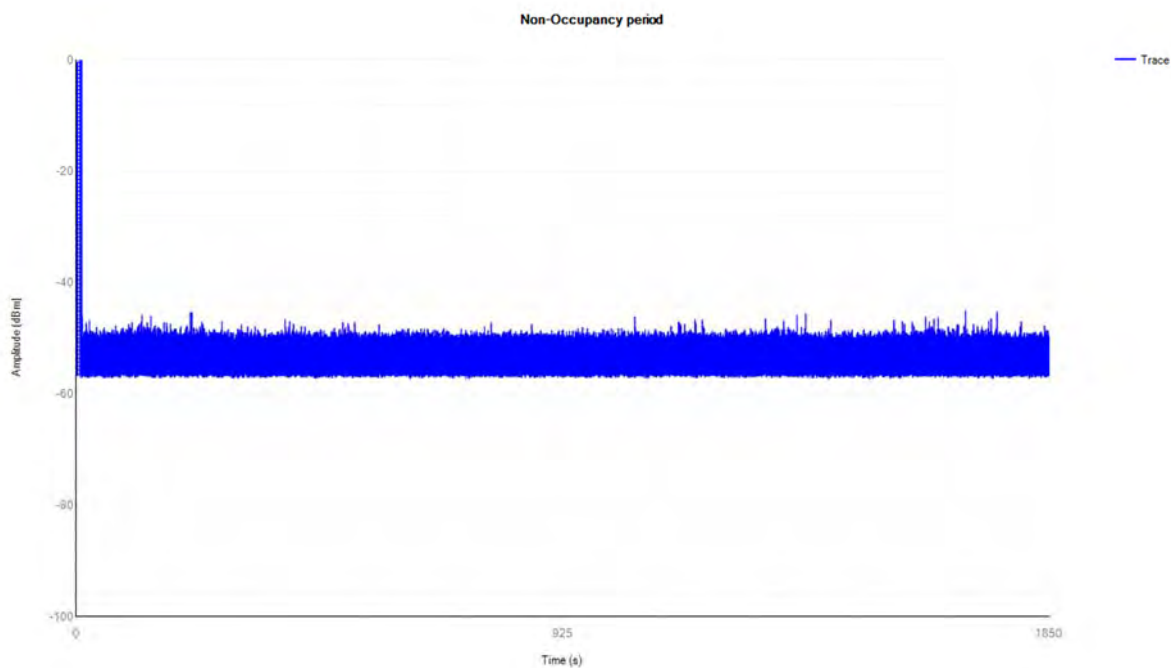
RBW: 3MHz

VBW: 3MHz

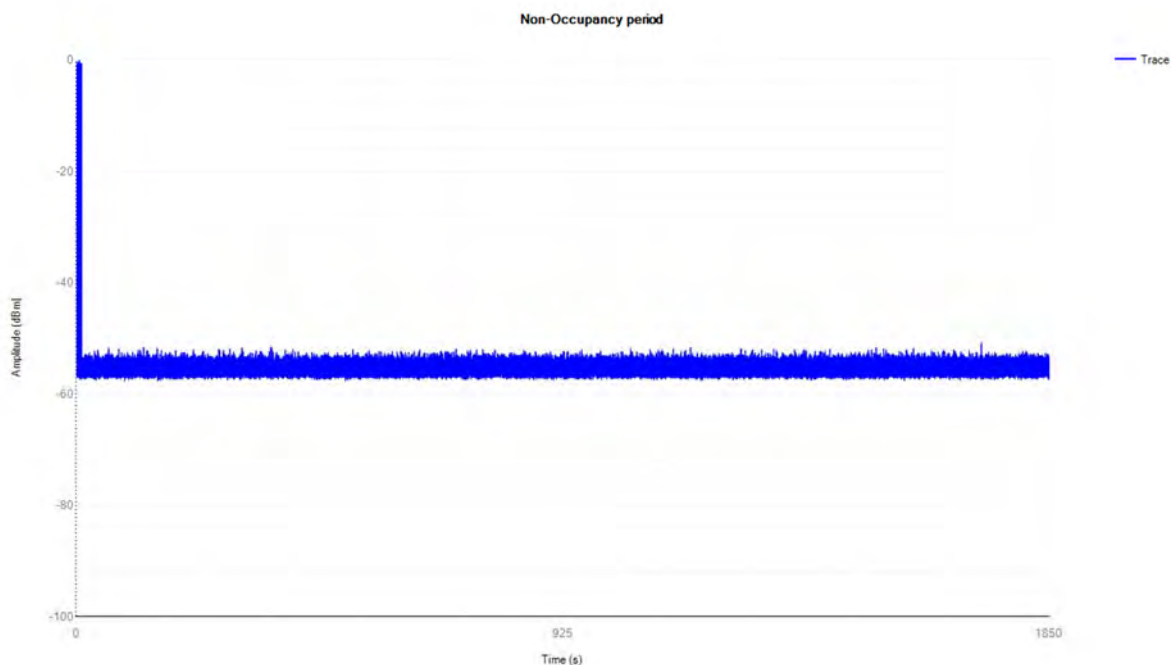
Sweep time: 1850s

Test Graphs

n20 5260MHz Non-Occupancy



n20 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+Adapter+U disk+loud speaker+PC1++PC adapter1+PC2+PC adapter2+HDMI cable1+HDMI cable2+WIFI TX

Test voltage: AC 120V/60Hz

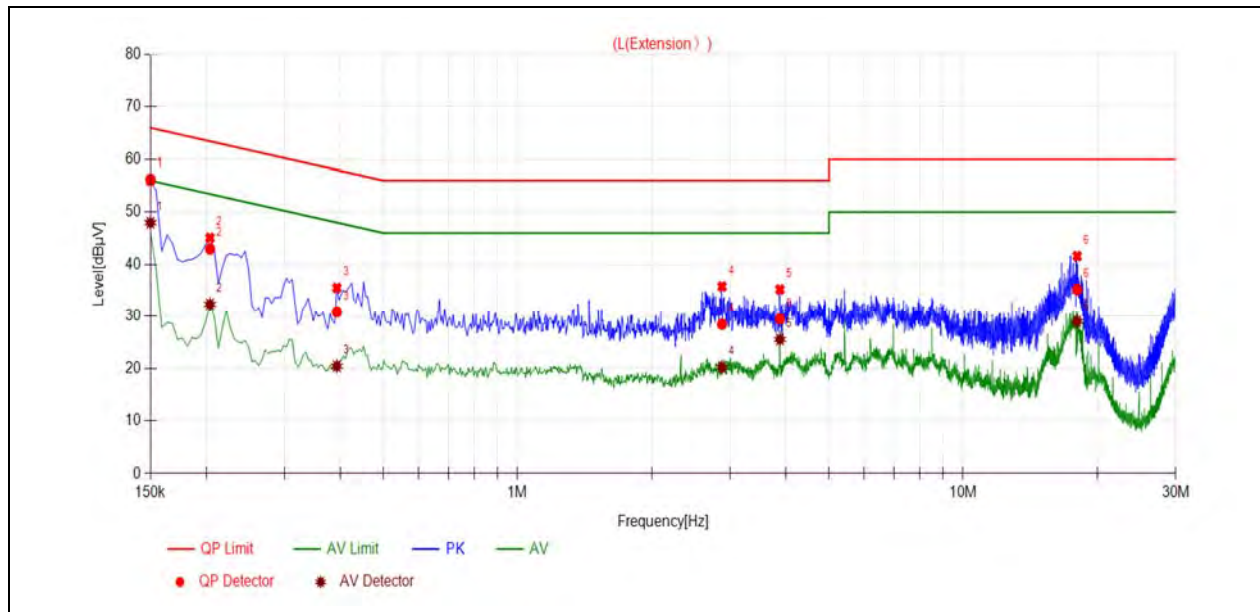
The measurement results are obtained as below:

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

U_R : Receiver Reading

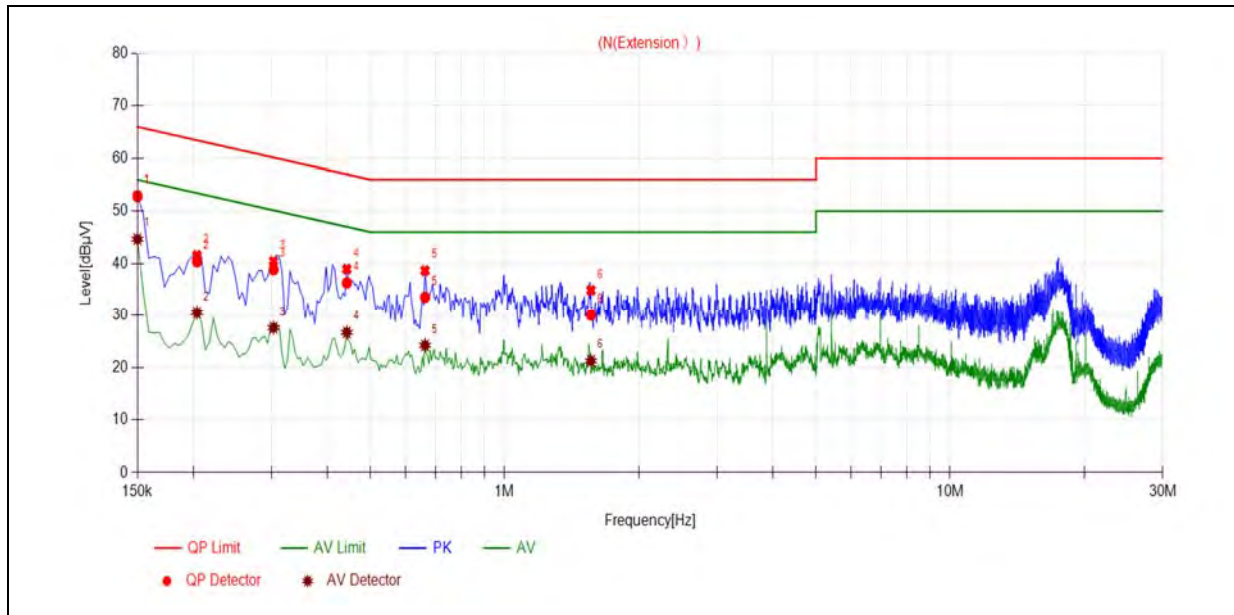
A_{Factor} : Voltage division factor of LISN

B. Test Plot:



(L Phase)

No.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1500	56.25	47.98	66.00	56.00	Line	PASS
2	0.2040	42.98	32.36	63.45	53.45		PASS
3	0.3930	30.85	20.40	58.00	48.00		PASS
4	2.8769	28.45	20.19	56.00	46.00		PASS
5	3.8808	29.46	25.51	56.00	46.00		PASS
6	18.0233	35.21	29.00	60.00	50.00		PASS



(N Phase)

No.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1500	52.81	44.66	66.00	56.00	Neutral	PASS
2	0.2040	40.36	30.54	63.45	53.45		PASS
3	0.3030	38.86	27.59	60.16	50.16		PASS
4	0.4425	36.30	26.69	57.01	47.01		PASS
5	0.6630	33.54	24.21	56.00	46.00		PASS
6	1.5629	30.06	21.24	56.00	46.00		PASS

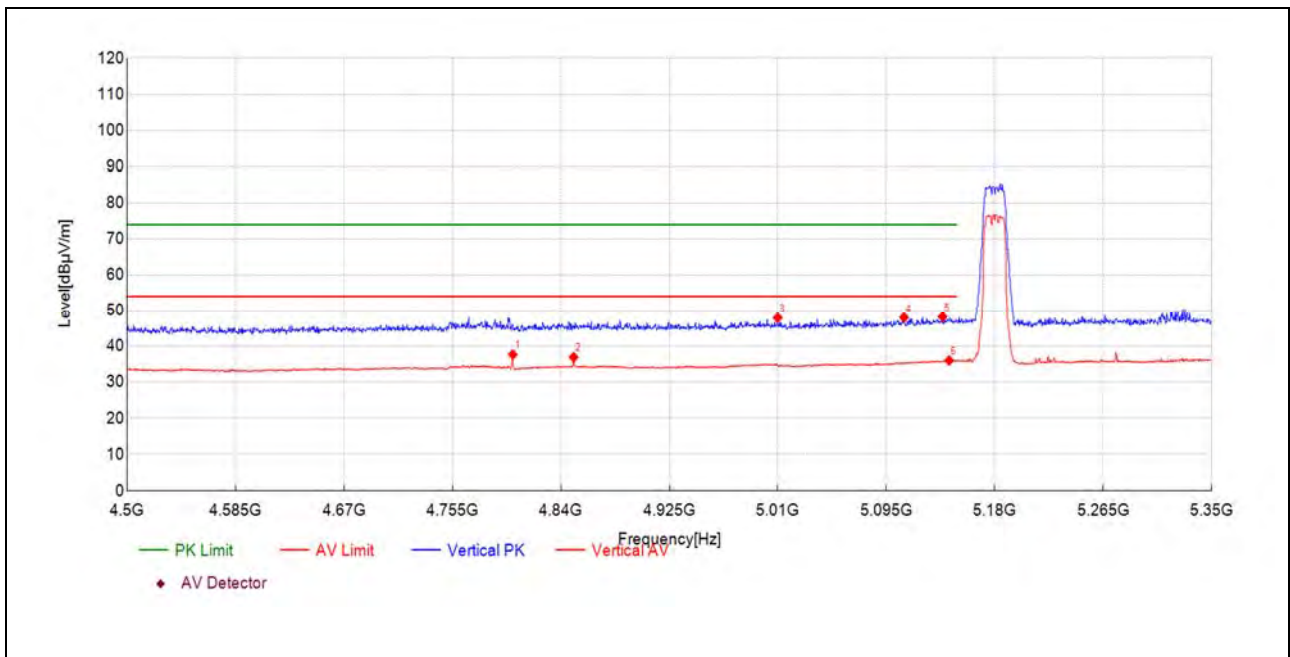
A.8. Restricted Frequency Bands

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

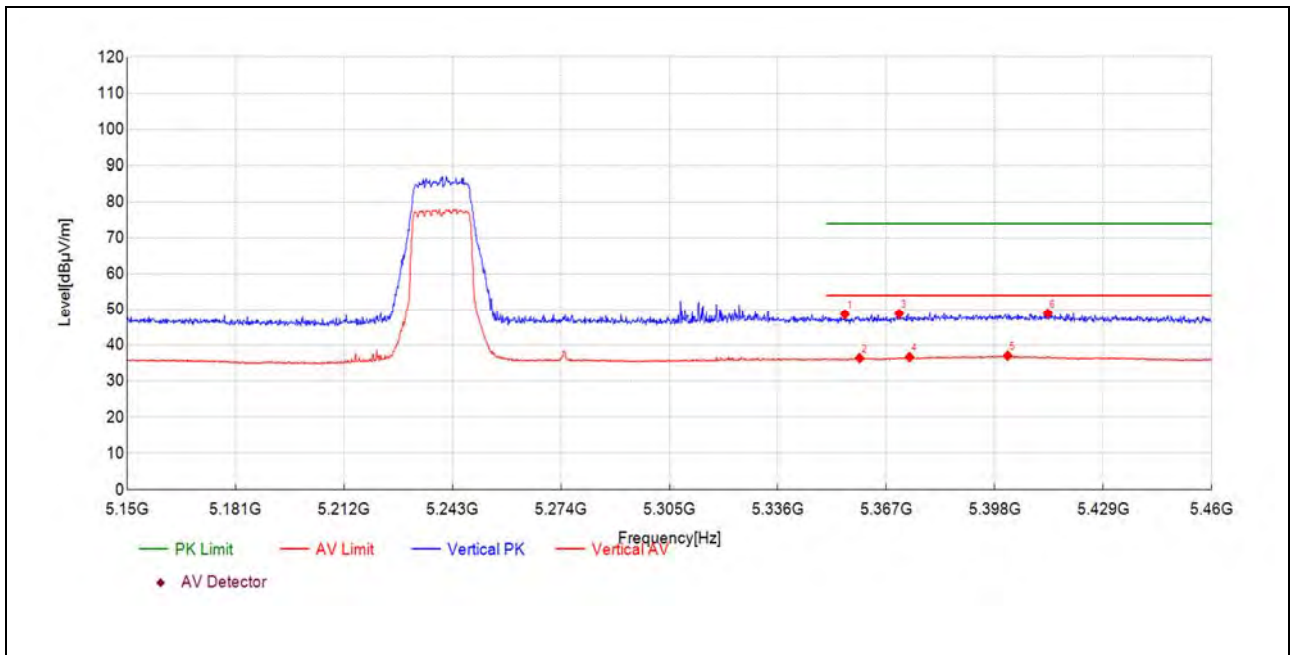
Plot for Channel 36



Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
4802.33	25.7	37.69	12.010	54.00	16.31	150	357	AV	PASS
4849.95	24.5	36.95	12.450	54.00	17.05	150	357	AV	PASS
5009.83	34.9	47.95	13.080	74.00	26.05	150	172	PK	PASS
5108.90	34.2	48.04	13.840	74.00	25.96	150	76	PK	PASS
5139.09	33.8	48.22	14.390	74.00	25.78	150	241	PK	PASS
5144.20	21.5	36.03	14.490	54.00	17.97	150	280	AV	PASS

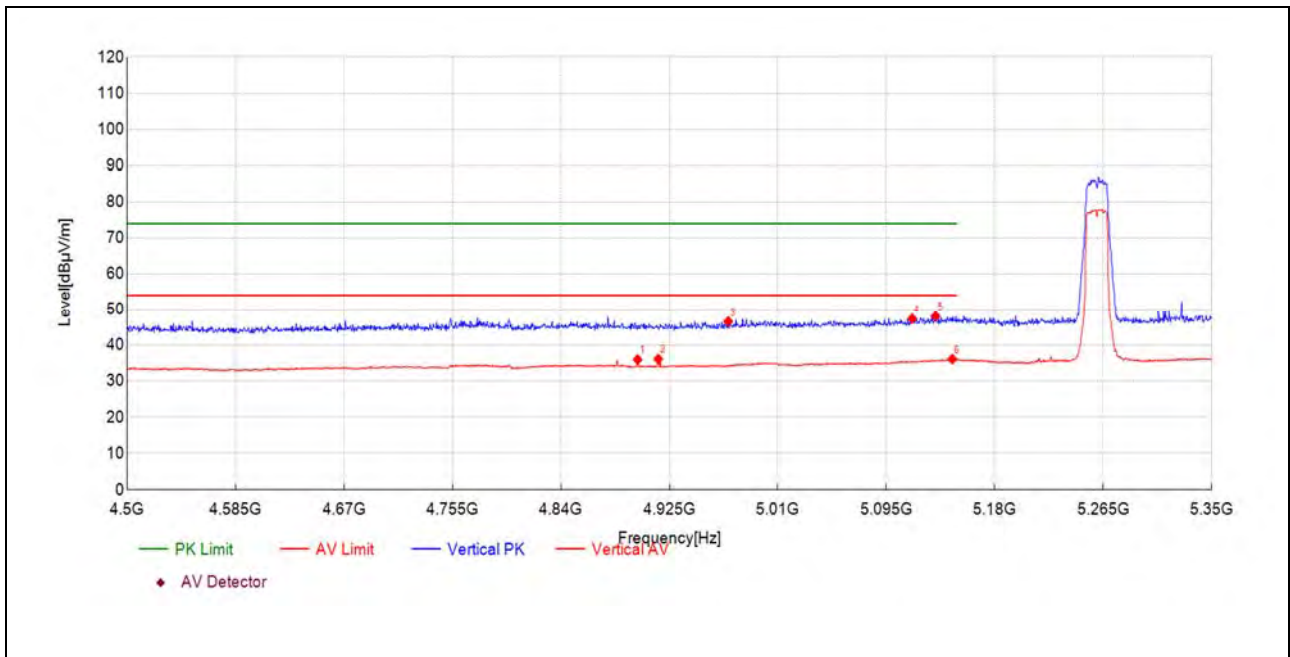


Plot for Channel 48



Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
5355.17	33.6	48.66	15.050	74.00	25.34	150	143	PK	PASS
5359.35	21.3	36.38	15.110	54.00	17.62	150	104	AV	PASS
5370.68	33.6	48.83	15.270	74.00	25.17	150	278	PK	PASS
5373.62	21.4	36.70	15.310	54.00	17.30	150	66	AV	PASS
5401.69	21.4	37.07	15.660	54.00	16.93	150	79	AV	PASS
5413.17	33.4	48.93	15.520	74.00	25.07	150	169	PK	PASS

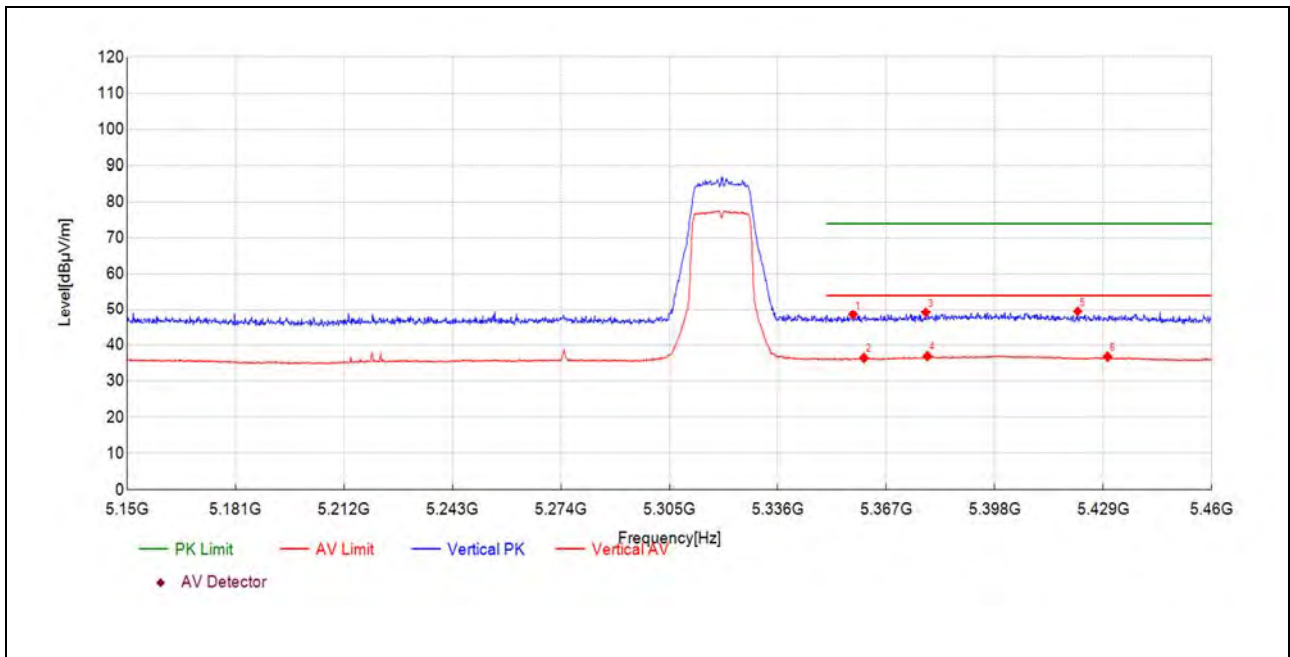
Plot for Channel 52



Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
4900.13	23.8	35.99	12.220	54.00	18.01	150	360	AV	PASS
4916.28	23.9	36.17	12.230	54.00	17.83	150	360	AV	PASS
4971.14	34.0	46.59	12.560	74.00	27.41	150	136	PK	PASS
5115.28	33.4	47.40	13.960	74.00	26.60	150	356	PK	PASS
5133.57	33.8	48.10	14.290	74.00	25.90	150	62	PK	PASS
5146.75	21.6	36.14	14.530	54.00	17.86	150	76	AV	PASS



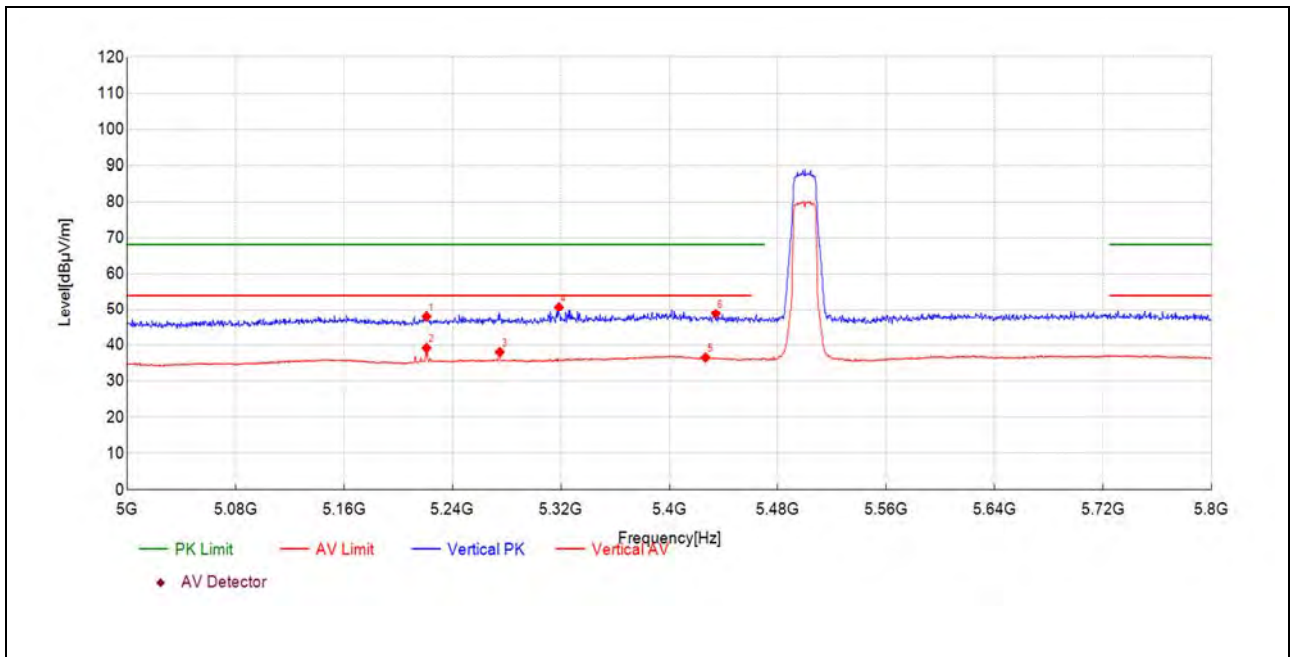
Plot for Channel 64



Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
5357.49	33.5	48.56	15.080	74.00	25.44	150	329	PK	PASS
5360.60	21.3	36.44	15.130	54.00	17.56	150	147	AV	PASS
5378.27	33.8	49.22	15.380	74.00	24.78	150	12	PK	PASS
5378.74	21.6	36.95	15.380	54.00	17.05	150	234	AV	PASS
5421.70	34.1	49.51	15.410	74.00	24.49	150	346	PK	PASS
5430.23	21.5	36.83	15.310	54.00	17.17	150	247	AV	PASS



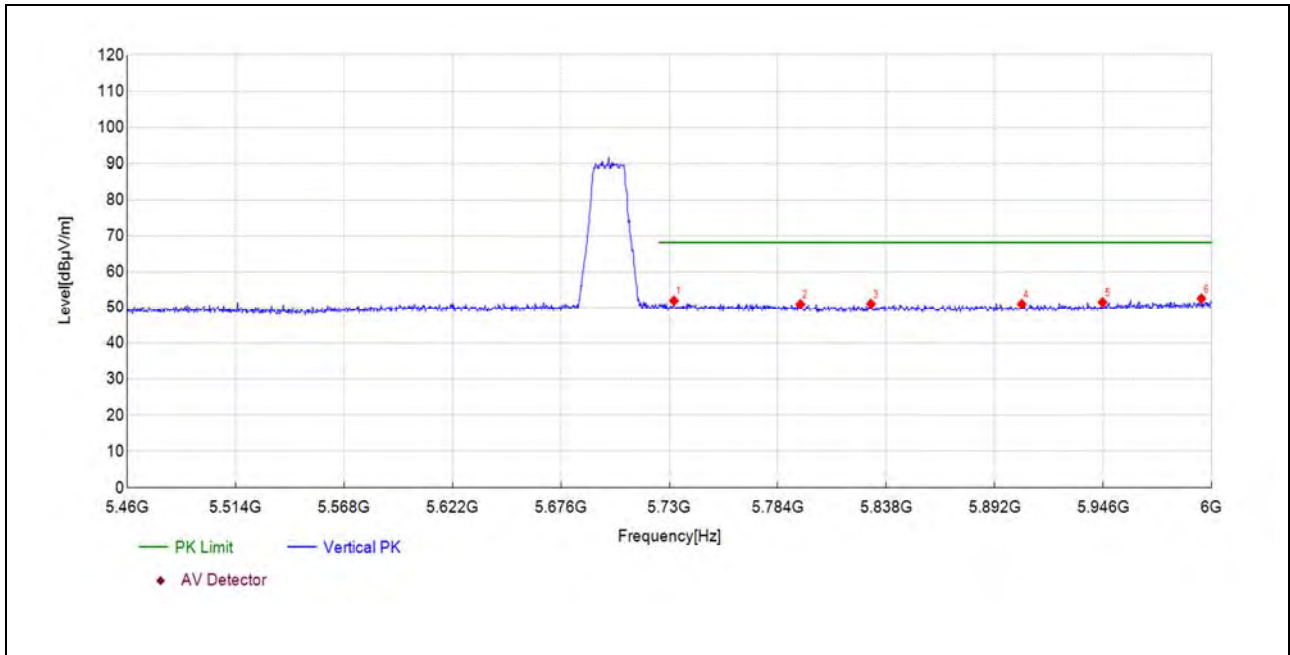
Plot for Channel 100



Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
5220.91	34.0	47.94	13.930	68.23	20.29	150	51	PK	PASS
5220.91	25.3	39.22	13.930	54.00	14.78	150	51	AV	PASS
5274.94	23.6	38.06	14.440	54.00	15.94	150	146	AV	PASS
5318.56	36.1	50.75	14.680	68.23	17.48	150	51	PK	PASS
5426.61	21.2	36.55	15.350	54.00	17.45	150	203	AV	PASS
5434.22	33.6	48.86	15.260	68.23	19.37	150	357	PK	PASS



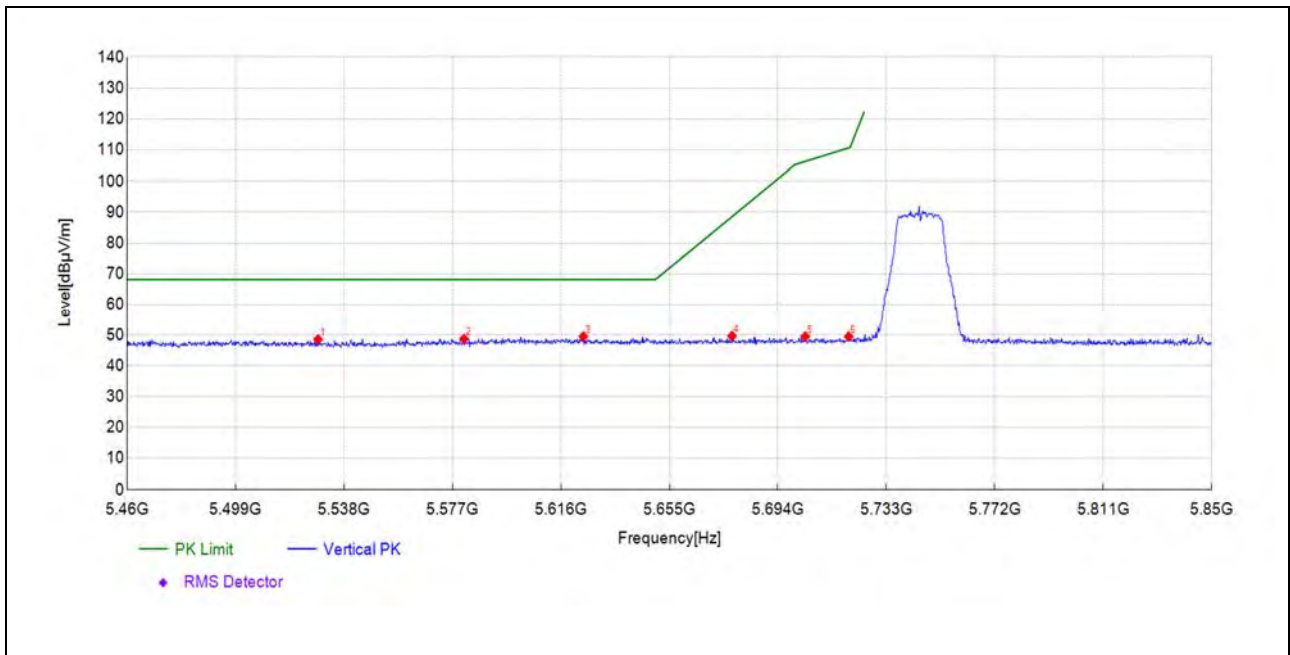
Plot for Channel 140



Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
5732.30	35.7	52.01	16.270	68.23	16.22	150	36	PK	PASS
5795.24	35.0	51.01	16.020	68.23	17.22	150	200	PK	PASS
5830.36	35.2	51.13	15.980	68.23	17.10	150	120	PK	PASS
5905.45	34.9	51.07	16.190	68.23	17.16	150	307	PK	PASS
5945.70	35.1	51.59	16.510	68.23	16.64	150	130	PK	PASS
5994.87	35.5	52.63	17.090	68.23	15.60	150	92	PK	PASS

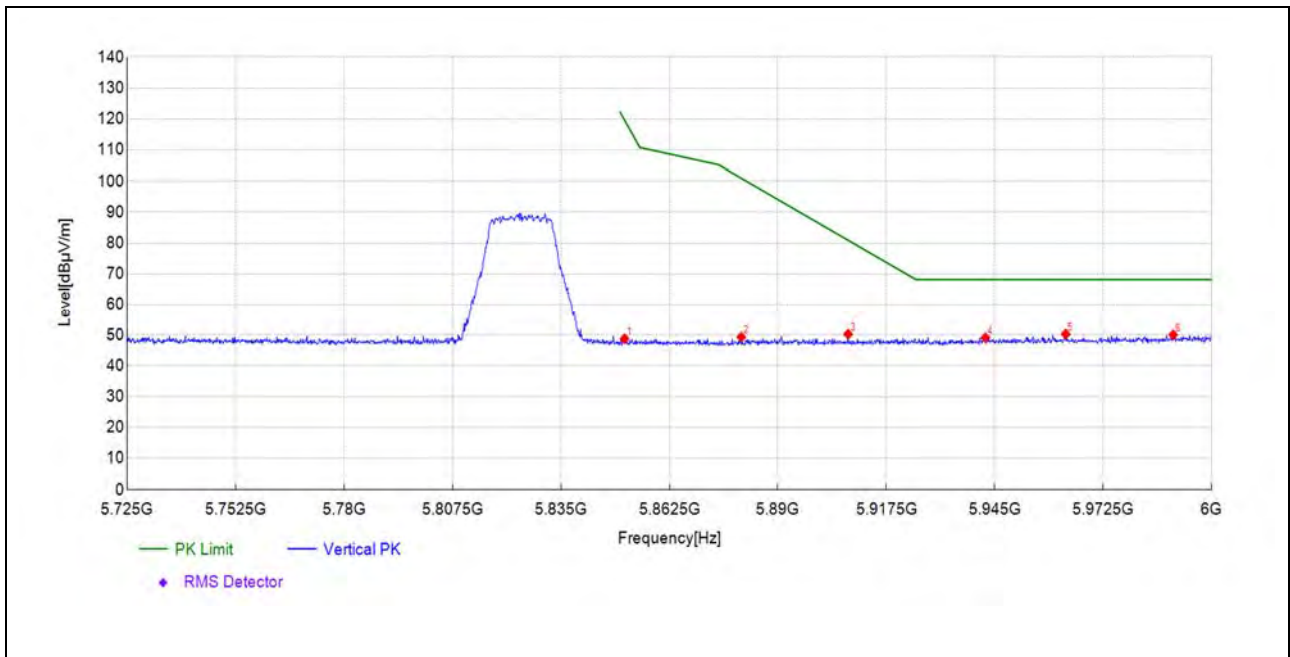


Plot for Channel 149



Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
5528.67	33.5	48.54	15.070	68.23	19.69	150	262	PK	PASS
5581.16	33.2	48.72	15.540	68.23	19.51	150	109	PK	PASS
5624.08	33.6	49.44	15.860	68.23	18.79	150	213	PK	PASS
5677.53	33.6	49.61	16.030	88.60	38.99	150	302	PK	PASS
5703.87	33.3	49.47	16.210	106.31	56.84	150	9	PK	PASS
5719.48	33.2	49.43	16.240	110.68	61.25	150	242	PK	PASS

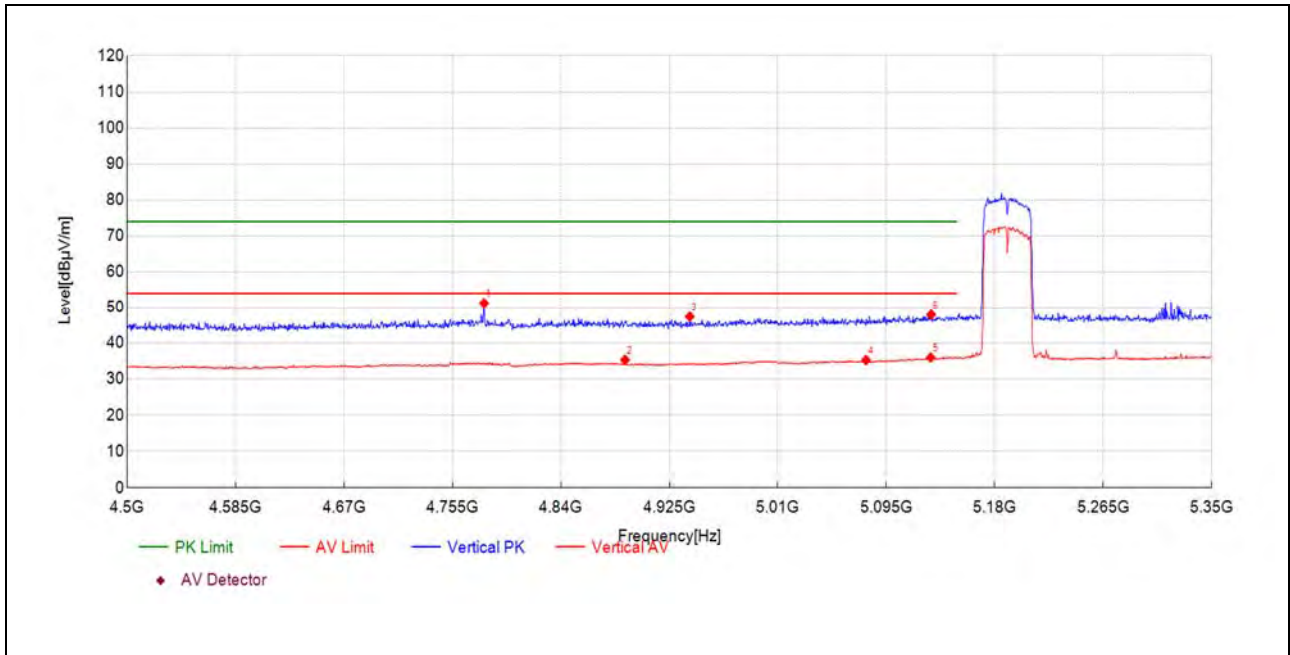
Plot for Channel 165



Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
5851.15	32.8	48.74	15.970	119.61	70.87	150	94	PK	PASS
5880.73	33.2	49.29	16.080	100.99	51.70	150	187	PK	PASS
5907.83	34.0	50.24	16.220	80.94	30.70	150	199	PK	PASS
5942.63	32.6	49.07	16.500	68.23	19.16	150	251	PK	PASS
5962.99	33.5	50.24	16.710	68.23	17.99	150	118	PK	PASS
5990.23	33.0	50.02	17.030	68.23	18.21	150	243	PK	PASS

**802.11n (HT40) Mode**

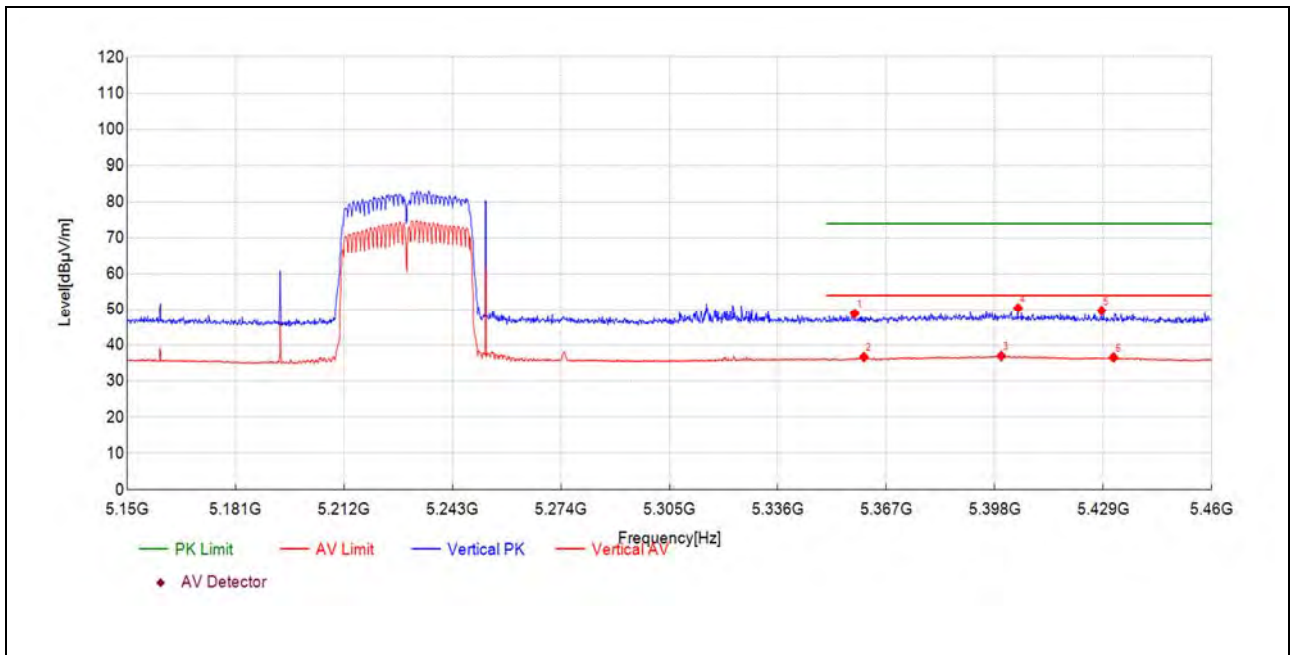
Plot for Channel 38



Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
4779.79	39.3	51.29	11.960	74.00	22.71	150	112	PK	PASS
4890.35	23.1	35.33	12.270	54.00	18.67	150	69	AV	PASS
4940.95	35.1	47.37	12.250	74.00	26.63	150	341	PK	PASS
5079.14	21.7	35.28	13.580	54.00	18.72	150	341	AV	PASS
5129.74	21.8	36.00	14.230	54.00	18.00	150	39	AV	PASS
5130.17	33.7	47.94	14.230	74.00	26.06	150	207	PK	PASS

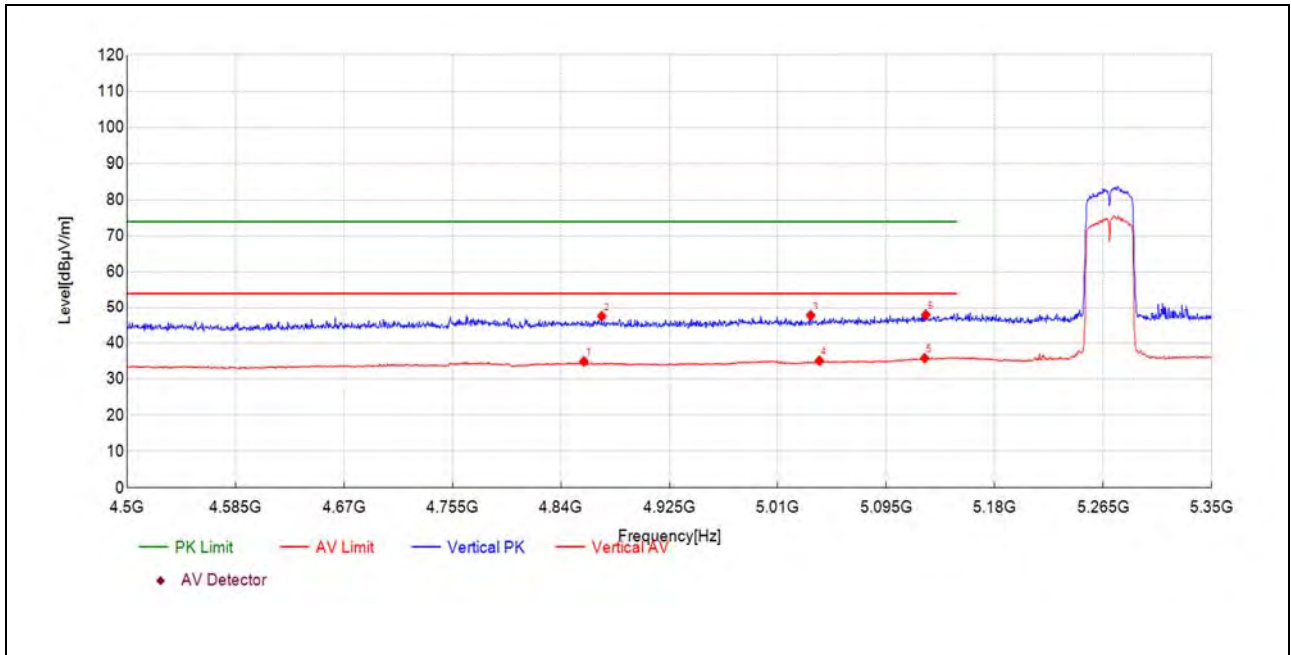


Plot for Channel 46



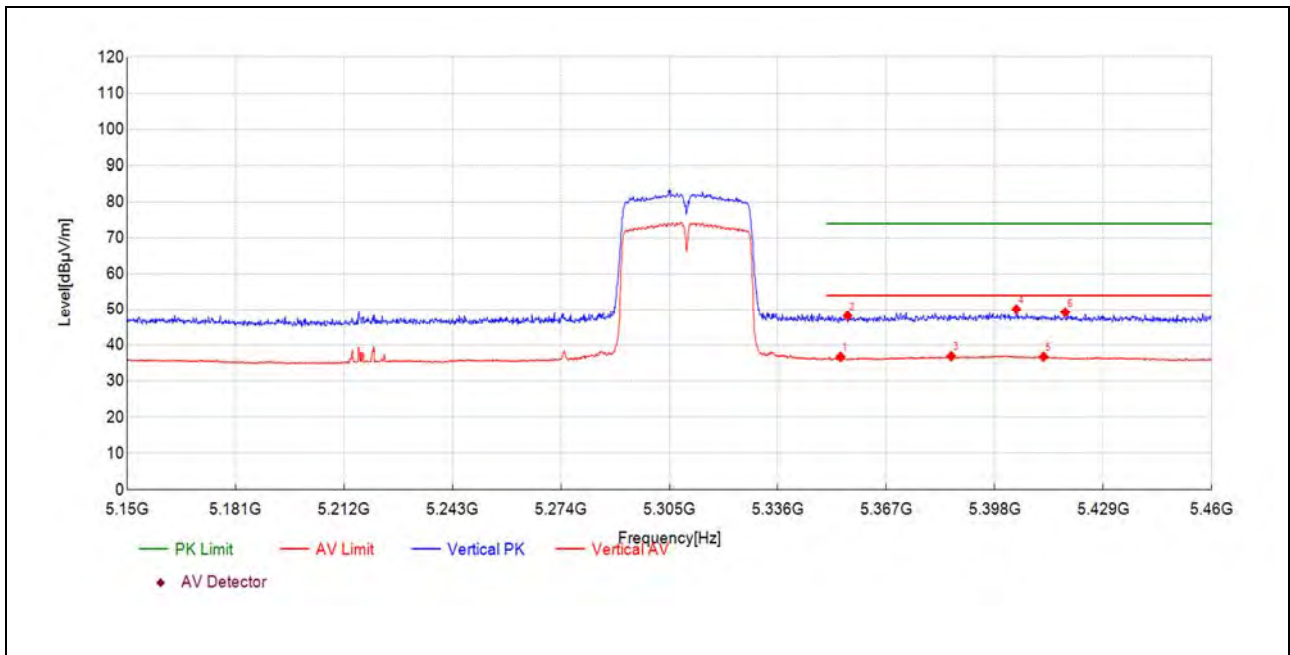
Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
5357.96	33.8	48.87	15.090	74.00	25.13	150	62	PK	PASS
5360.60	21.6	36.70	15.130	54.00	17.30	150	67	AV	PASS
5399.83	21.3	36.99	15.680	54.00	17.01	150	3	AV	PASS
5404.64	34.8	50.44	15.630	74.00	23.56	150	240	PK	PASS
5428.52	34.4	49.70	15.330	74.00	24.30	150	175	PK	PASS
5431.93	21.3	36.58	15.290	54.00	17.42	150	314	AV	PASS

Plot for Channel 54



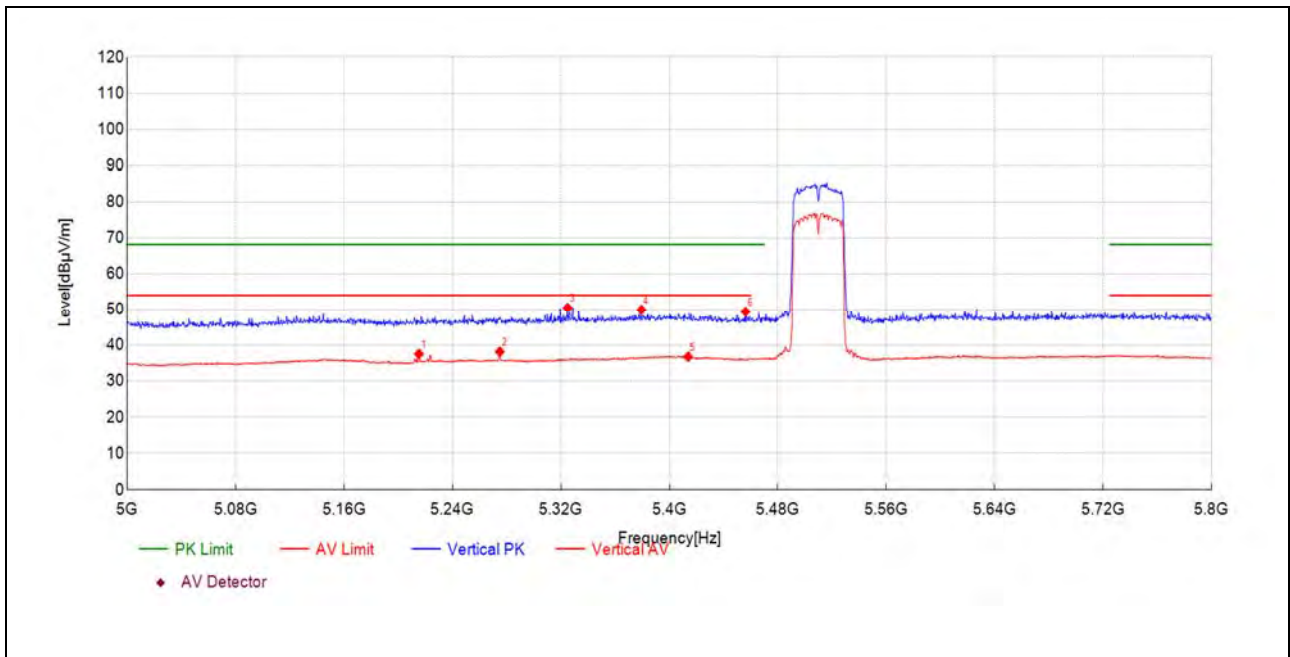
Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
4858.03	22.5	34.91	12.420	54.00	19.09	150	113	AV	PASS
4872.06	35.1	47.48	12.350	74.00	26.52	150	88	PK	PASS
5035.77	34.4	47.69	13.300	74.00	26.31	150	275	PK	PASS
5042.57	21.7	35.10	13.370	54.00	18.90	150	45	AV	PASS
5125.06	21.7	35.84	14.140	54.00	18.16	150	3	AV	PASS
5125.91	33.7	47.88	14.160	74.00	26.12	150	40	PK	PASS

Plot for Channel 62



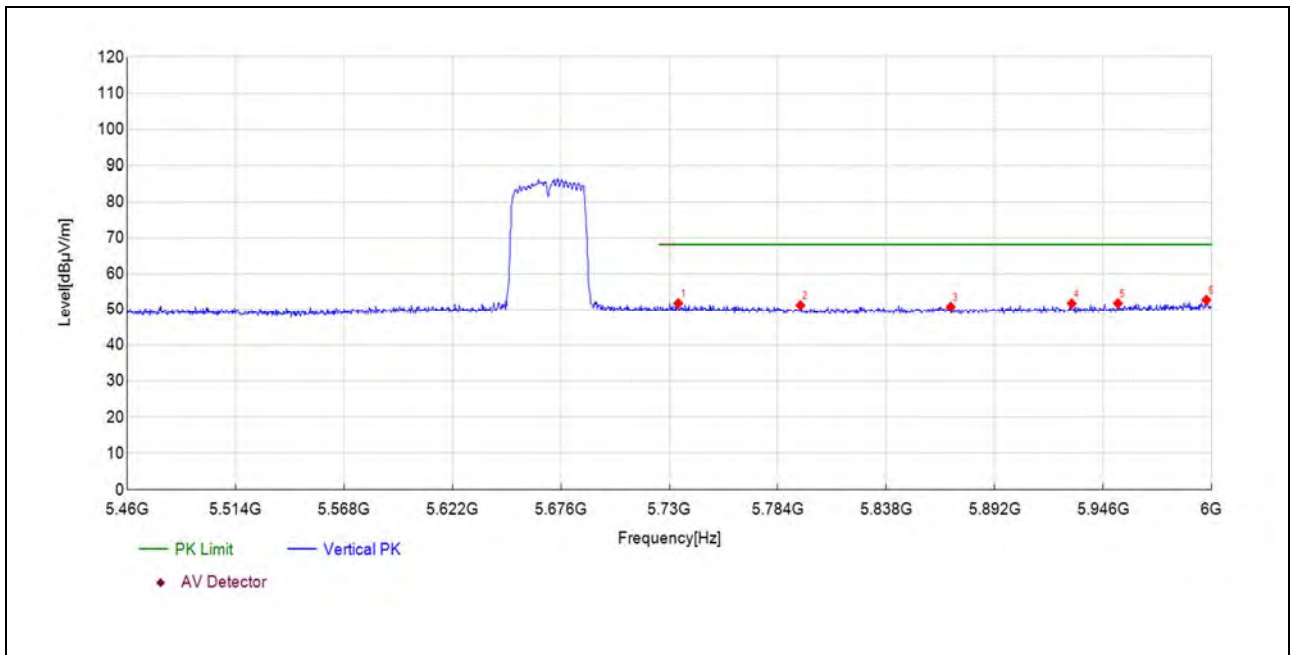
Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
5353.93	21.7	36.74	15.030	54.00	17.26	150	246	AV	PASS
5355.94	33.2	48.21	15.060	74.00	25.79	150	146	PK	PASS
5385.56	21.5	36.93	15.480	54.00	17.07	150	307	AV	PASS
5404.17	34.5	50.09	15.630	74.00	23.91	150	64	PK	PASS
5411.93	21.3	36.79	15.540	54.00	17.21	150	233	AV	PASS
5418.13	33.8	49.24	15.460	74.00	24.76	150	159	PK	PASS

Plot for Channel 102



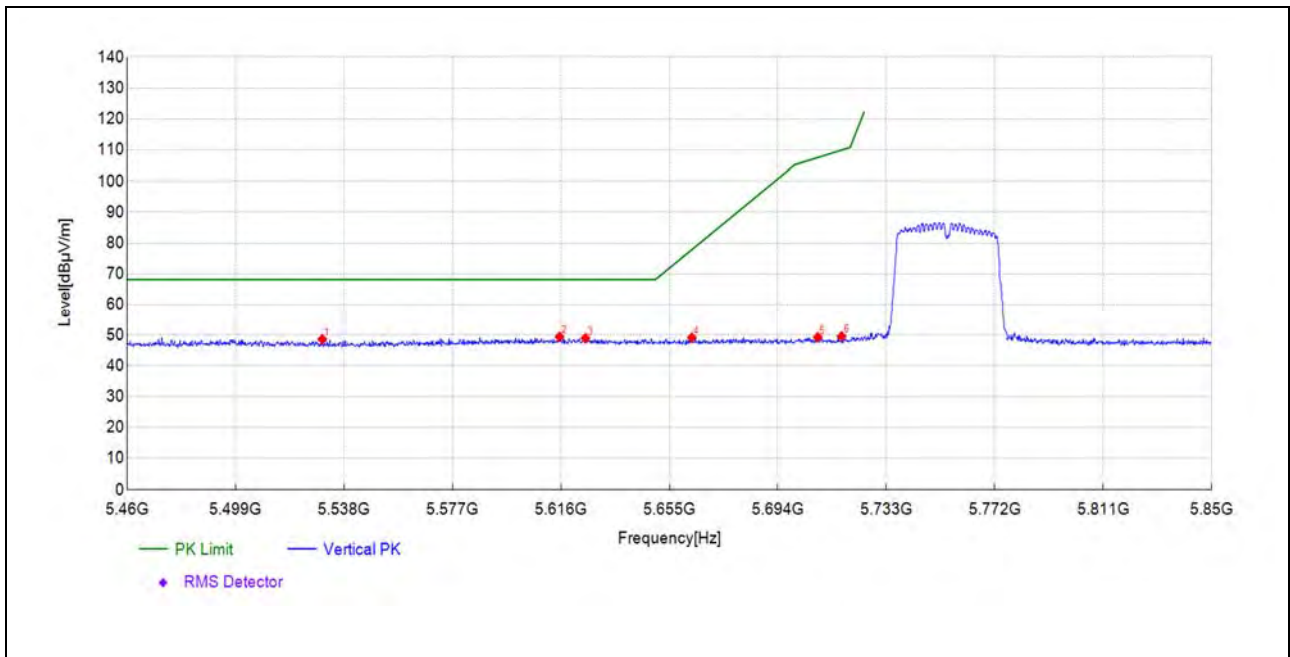
Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
5215.31	23.7	37.57	13.840	54.00	16.43	150	67	AV	PASS
5274.94	23.7	38.18	14.440	54.00	15.82	150	144	AV	PASS
5324.96	35.8	50.52	14.740	68.23	17.71	150	58	PK	PASS
5379.39	34.6	49.94	15.390	68.23	18.29	150	84	PK	PASS
5413.81	21.3	36.84	15.510	54.00	17.16	150	331	AV	PASS
5456.23	34.3	49.43	15.090	68.23	18.80	150	188	PK	PASS

Plot for Channel 134



Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
5734.46	35.6	51.87	16.260	68.23	16.36	150	270	PK	PASS
5795.24	35.3	51.30	16.020	68.23	16.93	150	233	PK	PASS
5870.07	34.8	50.85	16.040	68.23	17.38	150	256	PK	PASS
5930.31	35.4	51.82	16.390	68.23	16.41	150	65	PK	PASS
5953.27	35.3	51.86	16.590	68.23	16.37	150	0	PK	PASS
5997.30	35.7	52.79	17.110	68.23	15.44	150	289	PK	PASS

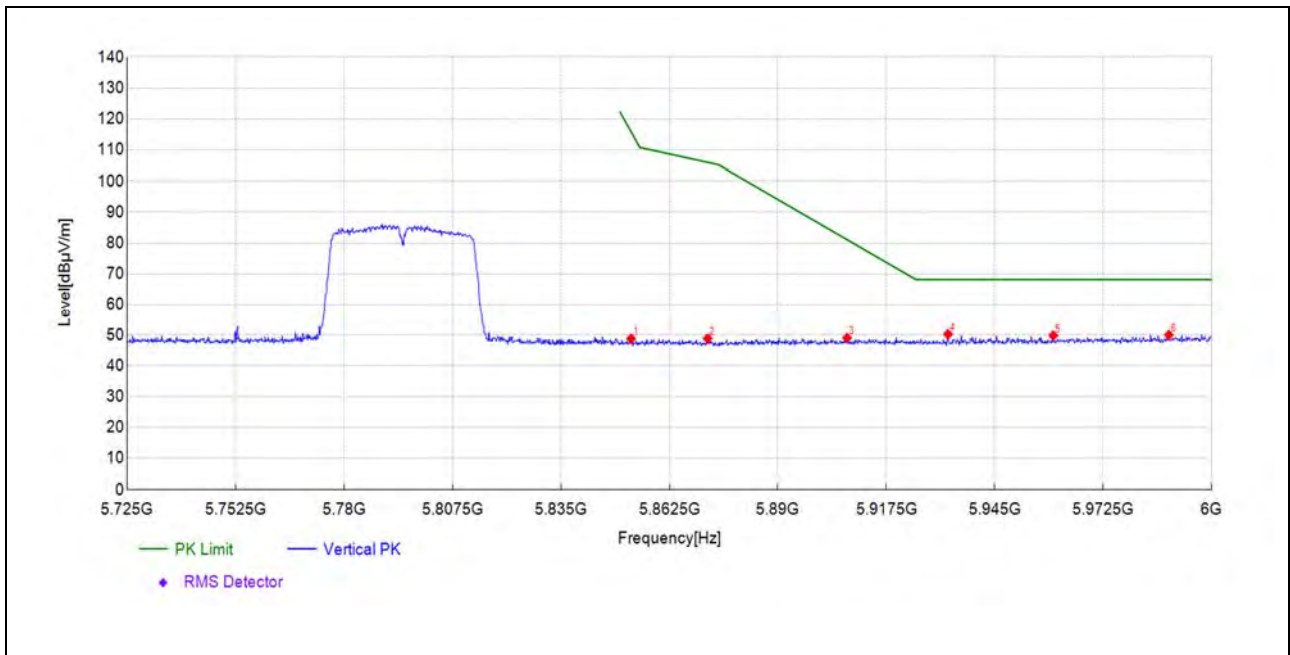
Plot for Channel 151



Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
5530.24	33.5	48.59	15.070	68.23	19.64	150	49	PK	PASS
5615.49	33.5	49.37	15.880	68.23	18.86	150	238	PK	PASS
5624.86	33.1	48.94	15.860	68.23	19.29	150	174	PK	PASS
5663.10	33.2	49.10	15.910	77.92	28.82	150	65	PK	PASS
5708.36	33.0	49.23	16.210	107.57	58.34	150	29	PK	PASS
5716.94	33.3	49.55	16.240	109.97	60.42	150	206	PK	PASS



Plot for Channel 159



Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
5852.80	32.8	48.75	15.980	115.84	67.09	150	118	PK	PASS
5872.20	32.8	48.81	16.050	106.01	57.20	150	114	PK	PASS
5907.55	32.8	49.00	16.220	81.14	32.14	150	26	PK	PASS
5933.14	33.8	50.21	16.420	68.23	18.02	150	106	PK	PASS
5959.83	33.1	49.75	16.670	68.23	18.48	150	315	PK	PASS
5989.13	33.0	49.97	17.020	68.23	18.26	150	207	PK	PASS



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:

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

A_T : Total correction Factor except Antenna

U_R : Receiver Reading

G_{preamp} : Preamplifier Gain

A_{Factor} : Antenna Factor at 3m

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

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

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

Note3: For the frequency, which started from 18GHz to 40GHz 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.

Field strength of fundamental:

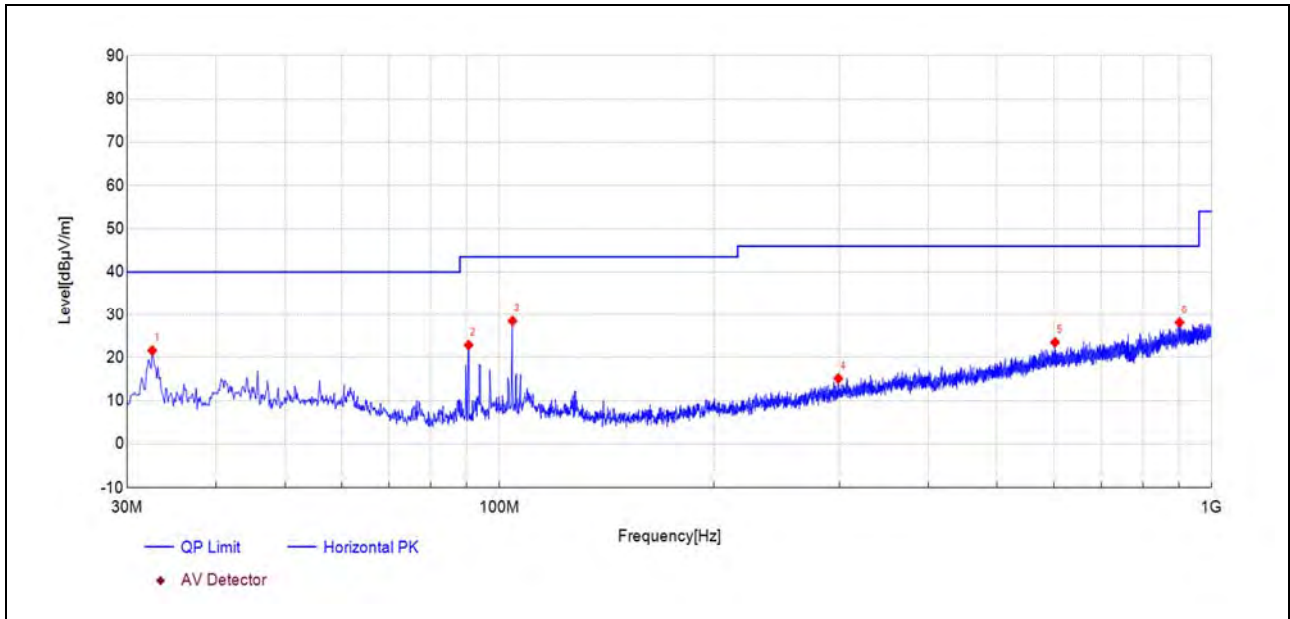
Frequency [MHz]	Reading [dB μ V]	Level [dB μ V/m]	Factor [dB/m]	Detector	Antenna Polarity
5184.59	71.4	85.31	13.910	PK	Vertical

The field strength (the lowest) of fundamenta is more than 20dB higher than the unwanted emissions, in accordance with FCC part 15.215(b).



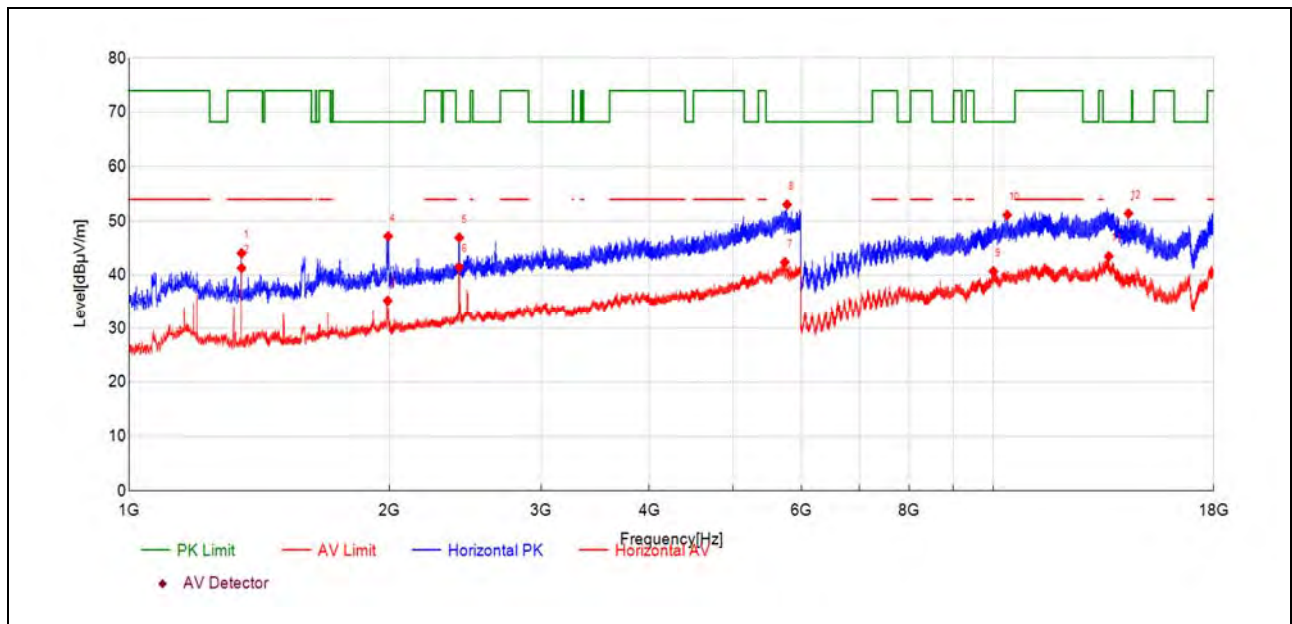
802.11a Mode

Plot for Channel 44



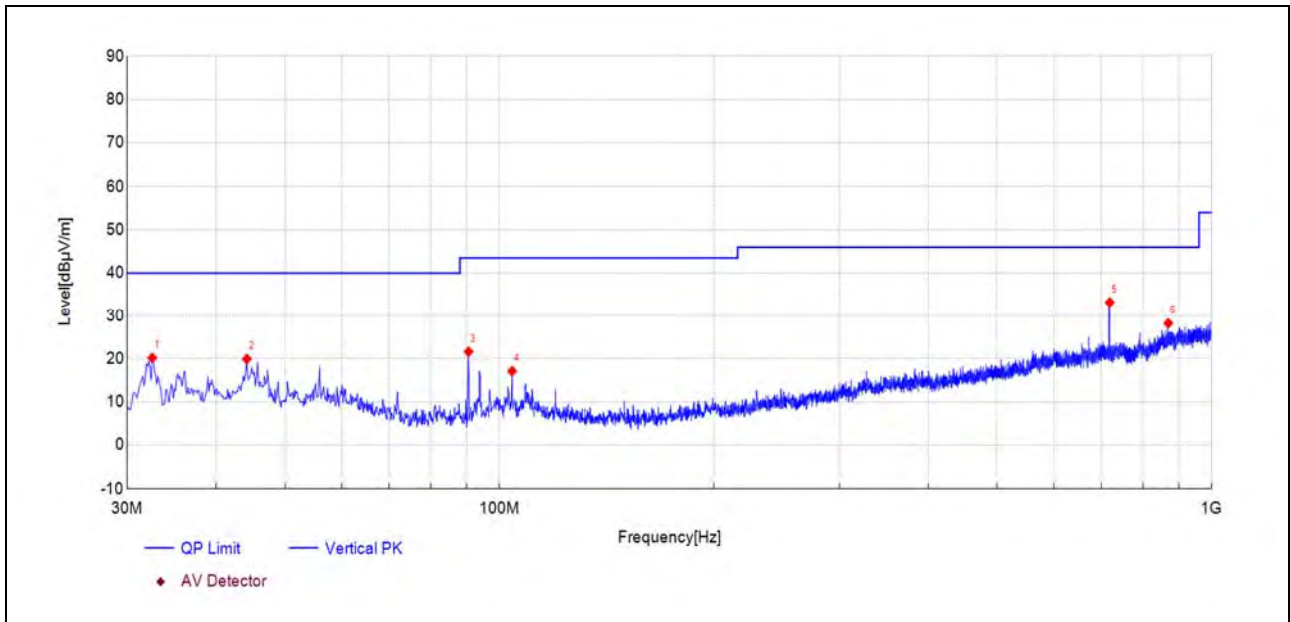
(Antenna Horizontal, 30MHz to 1GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
32.55	52.1	21.61	-30.470	40.00	18.39	150	130	PK	PASS
90.50	54.4	22.89	-31.460	43.50	20.61	150	180	PK	PASS
104.33	58.0	28.45	-29.510	43.50	15.05	150	220	PK	PASS
299.05	40.7	15.14	-25.540	46.00	30.86	150	230	PK	PASS
602.54	40.5	23.51	-16.980	46.00	22.49	150	190	PK	PASS
901.06	39.7	28.10	-11.550	46.00	17.90	150	90	PK	PASS



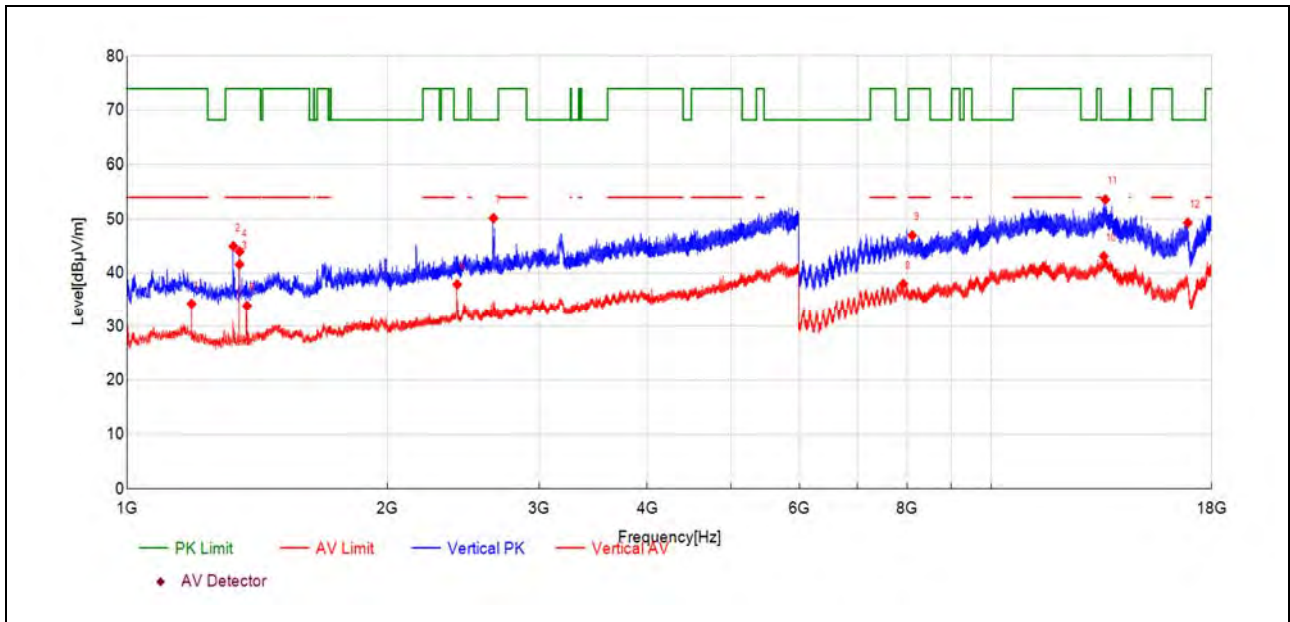
(Antenna Horizontal, 1GHz to 18GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
1349.67	44.7	44.04	-0.630	74.00	29.96	150	230	PK	PASS
1349.67	41.9	41.31	-0.630	54.00	12.69	150	220	AV	PASS
1992.21	32.4	35.23	2.880	-	-	150	50	AV	NA
1994.71	44.3	47.20	2.910	68.23	21.03	150	220	PK	PASS
2410.82	41.2	46.92	5.740	68.23	21.31	150	10	PK	PASS
2411.17	35.7	41.49	5.760	-	-	150	10	AV	NA
5739.62	23.0	42.38	19.400	-	-	150	290	AV	NA
5774.98	33.9	53.07	19.130	68.23	15.16	150	320	PK	PASS
10006.40	30.3	40.68	10.410	-	-	150	70	AV	NA
10381.42	40.1	51.12	11.070	68.23	17.11	150	310	PK	PASS
13610.18	26.5	43.49	17.020	-	-	150	210	AV	NA
14341.62	36.3	51.41	15.080	68.23	16.82	150	110	PK	PASS



(Antenna Vertical, 30MHz to 1GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
32.55	50.6	20.17	-30.470	40.00	19.83	150	230	PK	PASS
44.19	47.8	19.93	-27.870	40.00	20.07	150	240	PK	PASS
90.50	53.1	21.62	-31.460	43.50	21.88	150	100	PK	PASS
104.21	46.7	17.10	-29.570	43.50	26.40	150	260	PK	PASS
719.19	48.8	33.19	-15.650	46.00	12.81	150	20	PK	PASS
869.05	40.7	28.23	-12.430	46.00	17.77	150	180	PK	PASS

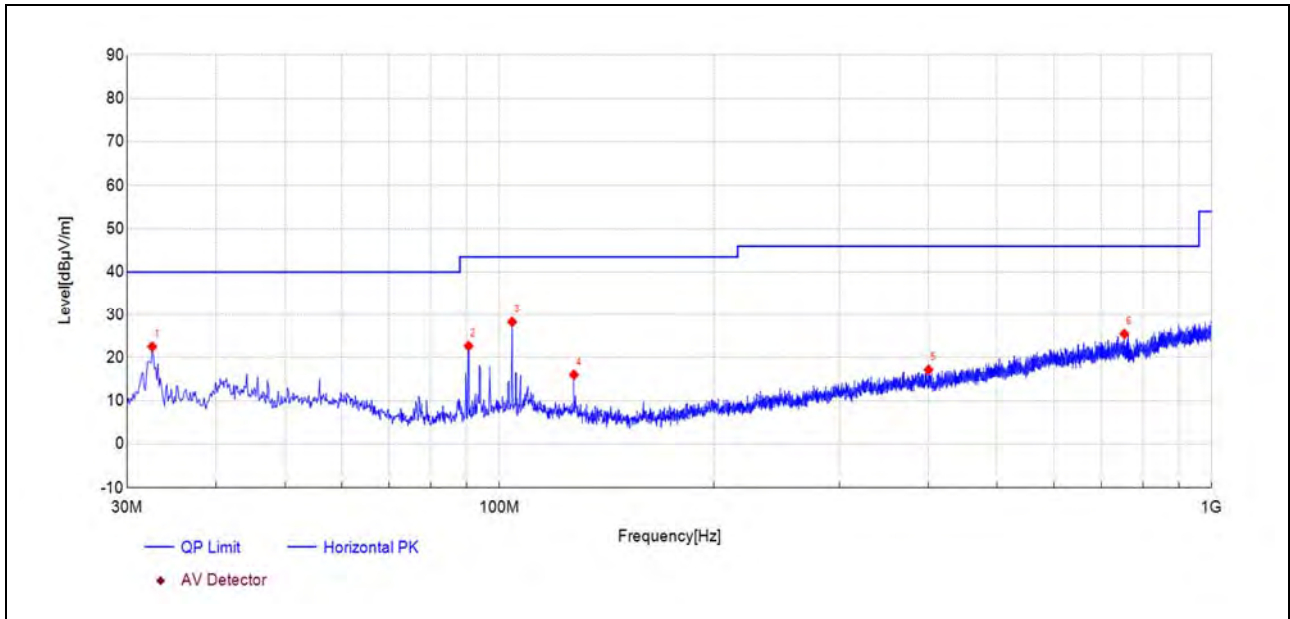


(Antenna Vertical, 1GHz to 18GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
1187.87	35.2	34.28	-0.950	54.00	19.72	150	310	AV	PASS
1327.88	45.7	44.97	-0.750	74.00	29.03	150	290	PK	PASS
1349.67	42.2	41.60	-0.630	54.00	12.40	150	280	AV	PASS
1350.03	44.6	43.97	-0.630	74.00	30.03	150	280	PK	PASS
1376.81	34.2	33.91	-0.280	54.00	20.09	150	280	AV	PASS
2410.46	32.2	37.90	5.740	-	-	150	150	AV	NA
2655.48	43.5	50.17	6.700	68.23	18.06	150	170	PK	PASS
7911.70	32.4	37.99	5.580	-	-	150	30	AV	NA
8104.91	41.2	46.97	5.770	74.00	27.03	150	210	PK	PASS
13500.98	26.1	43.13	17.070	-	-	150	200	AV	NA
13559.78	36.5	53.61	17.090	68.23	14.62	150	0	PK	PASS
16886.94	33.2	49.32	16.140	68.23	18.91	150	60	PK	PASS

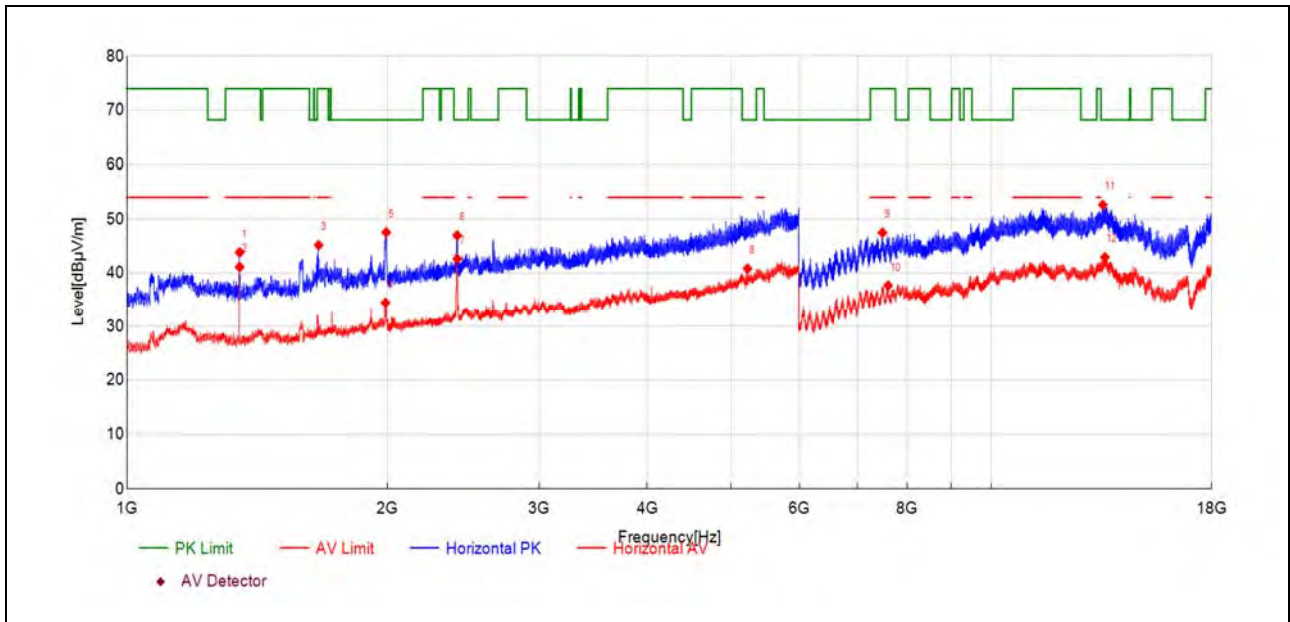


Plot for Channel 60



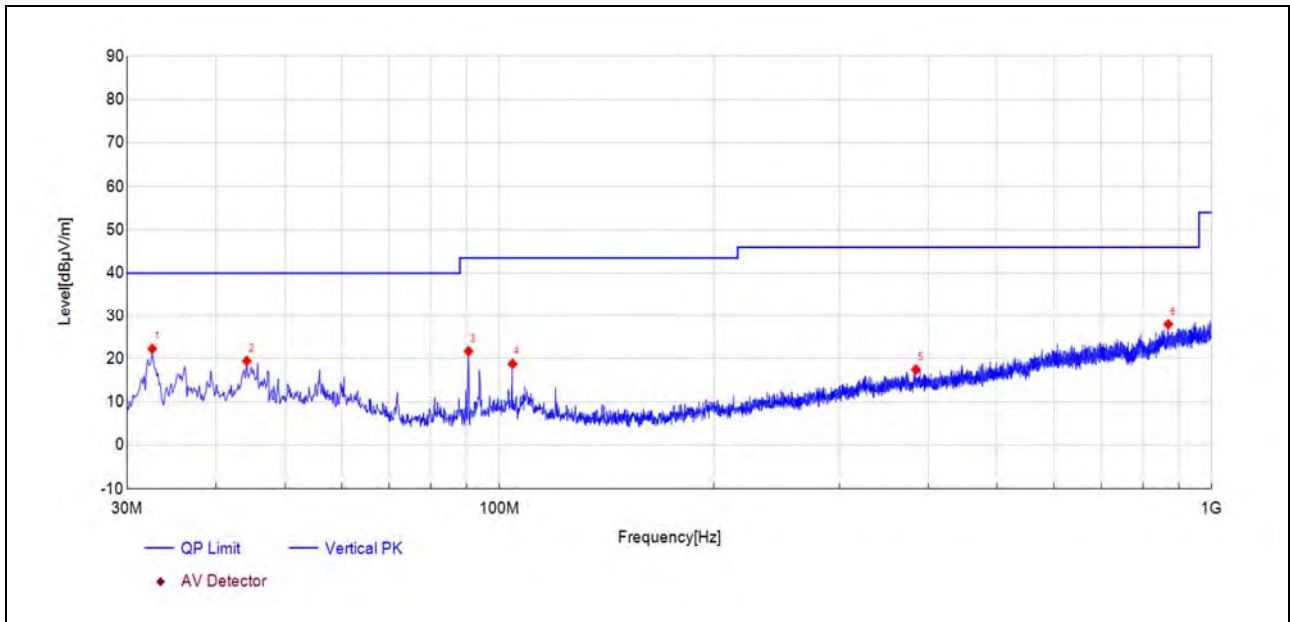
(Antenna Horizontal, 30MHz to 1GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
32.55	53.0	22.52	-30.470	40.00	17.48	150	20	PK	PASS
90.50	54.1	22.68	-31.460	43.50	20.82	150	340	PK	PASS
104.21	57.8	28.26	-29.570	43.50	15.24	150	340	PK	PASS
127.24	47.3	16.03	-31.290	43.50	27.47	150	10	PK	PASS
400.42	39.5	17.19	-22.330	46.00	28.81	150	300	PK	PASS
754.11	40.4	25.46	-14.940	46.00	20.54	150	210	PK	PASS



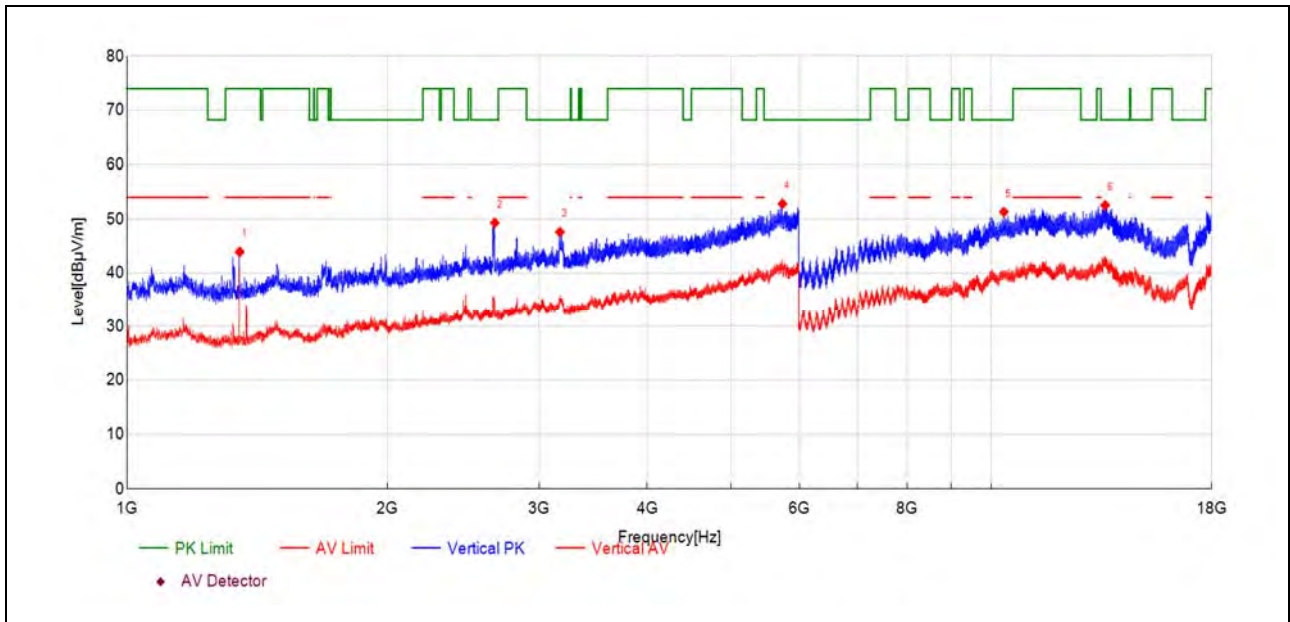
(Antenna Horizontal, 1GHz to 18GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
1350.03	44.5	43.83	-0.630	74.00	30.17	150	350	PK	PASS
1350.03	41.8	41.14	-0.630	54.00	12.86	150	340	AV	PASS
1666.12	44.8	45.18	0.340	74.00	28.82	150	110	PK	PASS
1991.14	31.6	34.49	2.870	-	-	150	250	AV	NA
1995.07	44.6	47.54	2.910	68.23	20.69	150	290	PK	PASS
2410.46	41.2	46.97	5.740	68.23	21.26	150	130	PK	PASS
2411.17	36.9	42.64	5.760	-	-	150	260	AV	NA
5225.30	24.6	40.82	16.270	-	-	150	40	AV	NA
7486.87	42.0	47.47	5.440	74.00	26.53	150	50	PK	PASS
7600.28	32.1	37.69	5.600	54.00	16.31	150	80	AV	PASS
13463.77	35.8	52.65	16.820	68.23	15.58	150	250	PK	PASS
13544.18	25.8	42.93	17.090	-	-	150	160	AV	NA



(Antenna Vertical, 30MHz to 1GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
32.55	52.7	22.26	-30.470	40.00	17.74	150	180	PK	PASS
44.19	47.3	19.46	-27.870	40.00	20.54	150	310	PK	PASS
90.50	53.2	21.71	-31.460	43.50	21.79	150	40	PK	PASS
104.33	48.3	18.77	-29.510	43.50	24.73	150	360	PK	PASS
384.41	40.1	17.44	-22.670	46.00	28.56	150	190	PK	PASS
869.05	40.4	27.94	-12.430	46.00	18.06	150	80	PK	PASS

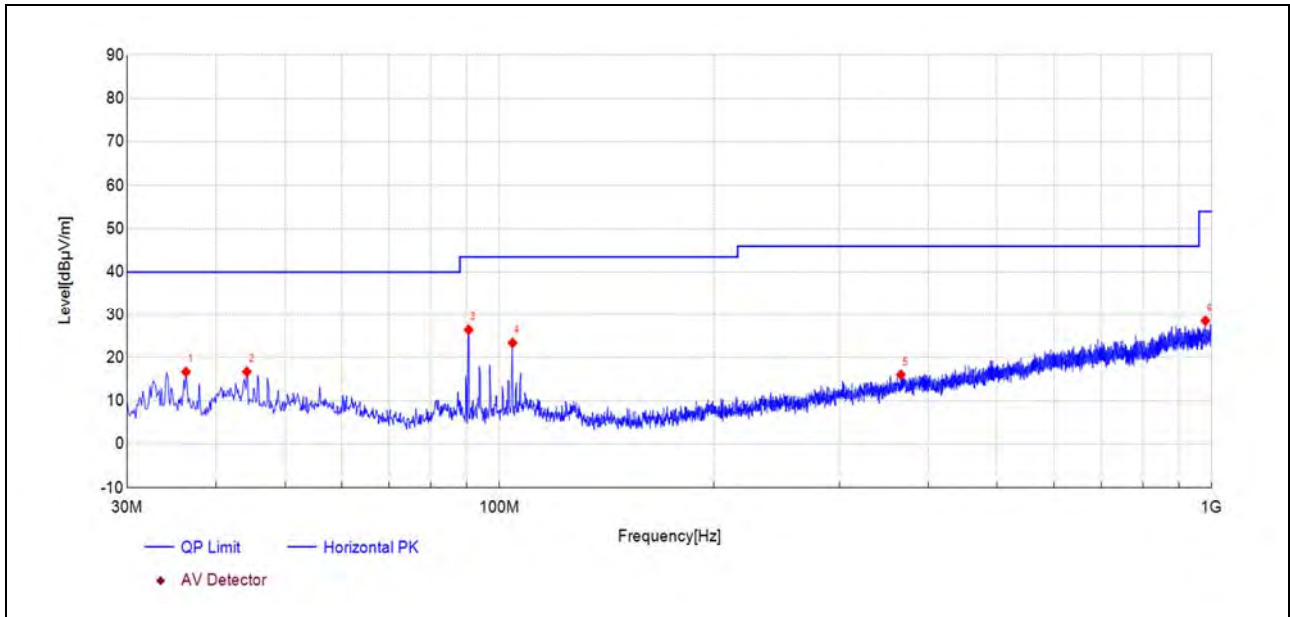


(Antenna Vertical, 1GHz to 18GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
1350.03	44.6	43.95	-0.630	74.00	30.05	150	270	PK	PASS
2664.40	42.7	49.32	6.640	68.23	18.91	150	40	PK	PASS
3169.44	38.8	47.60	8.840	68.23	20.63	150	320	PK	PASS
5734.62	33.4	52.82	19.410	68.23	15.41	150	330	PK	PASS
10344.22	40.4	51.31	10.900	68.23	16.92	150	320	PK	PASS
13547.78	35.5	52.55	17.090	68.23	15.68	150	160	PK	PASS

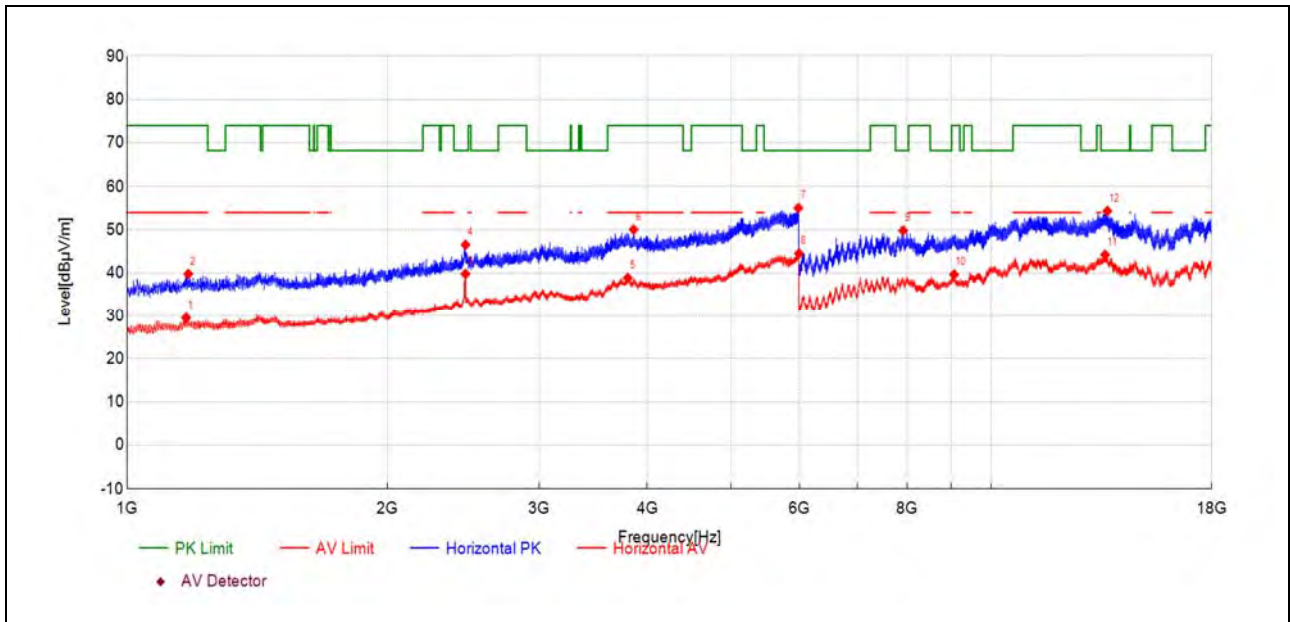


Plot for Channel 116



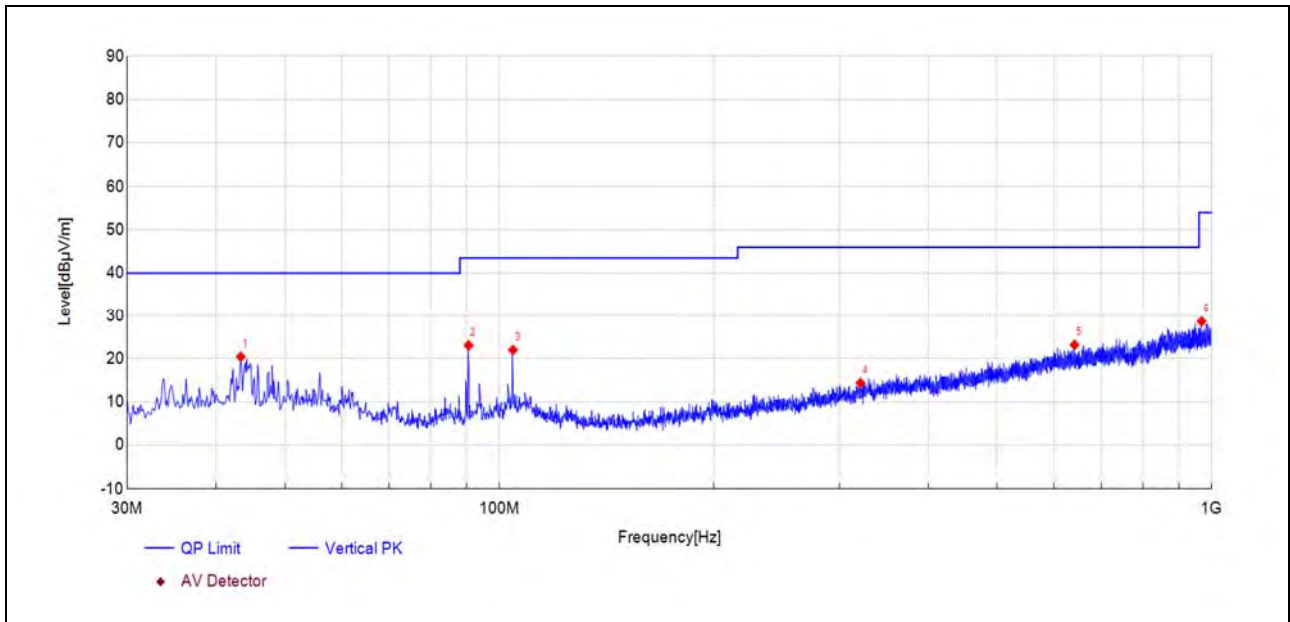
(Antenna Horizontal, 30MHz to 1GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
36.31	46.2	16.68	-29.500	40.00	23.32	150	260	PK	PASS
44.19	44.6	16.72	-27.870	40.00	23.28	150	310	PK	PASS
90.51	57.9	26.43	-31.460	43.50	17.07	150	120	PK	PASS
104.34	52.9	23.38	-29.500	43.50	20.12	150	10	PK	PASS
366.15	39.3	16.02	-23.270	46.00	29.98	150	70	PK	PASS
979.75	39.8	28.51	-11.310	54.00	25.49	150	340	PK	PASS



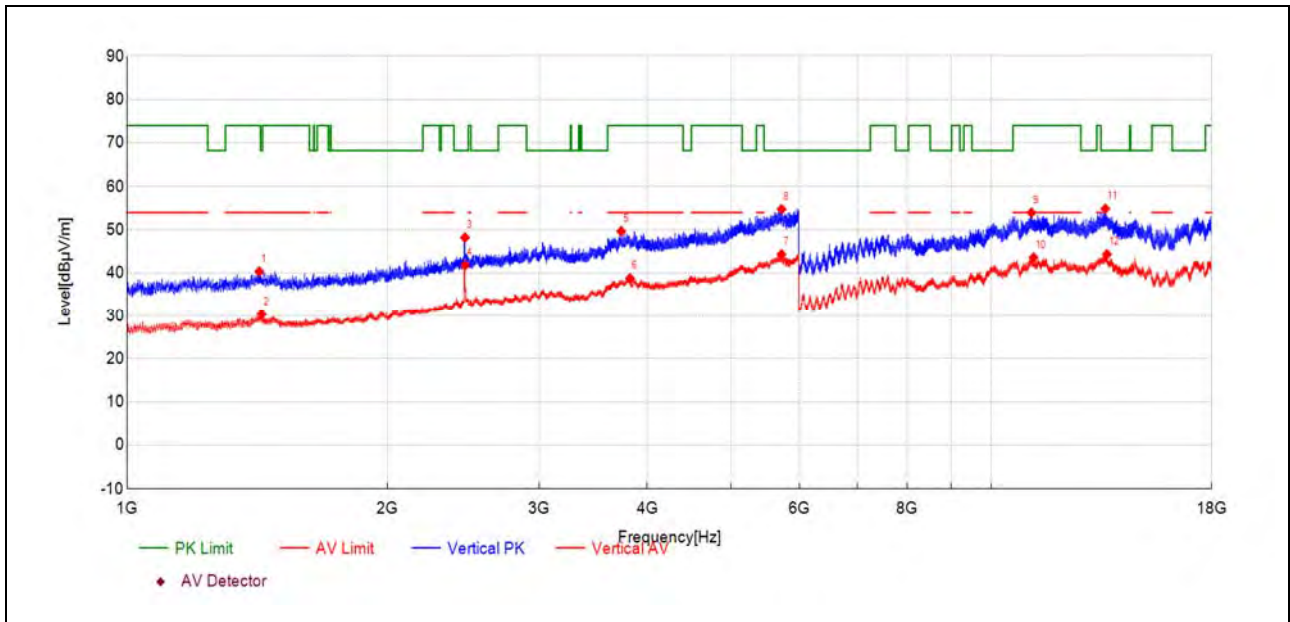
(Antenna Horizontal, 1GHz to 18GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
1170.73	30.8	29.52	-1.290	54.00	24.48	150	20	AV	PASS
1177.51	40.9	39.79	-1.150	74.00	34.21	150	130	PK	PASS
2464.03	33.3	39.80	6.550	-	-	150	320	AV	NA
2464.75	40.0	46.56	6.550	68.23	21.67	150	330	PK	PASS
3797.34	27.3	38.91	11.660	54.00	15.09	150	190	AV	PASS
3857.70	38.5	50.08	11.610	74.00	23.92	150	280	PK	PASS
5982.14	35.5	55.06	19.610	68.23	13.17	150	140	PK	PASS
5992.50	24.8	44.54	19.710	-	-	150	300	AV	NA
7909.90	44.3	49.85	5.600	68.23	18.38	150	60	PK	PASS
9060.15	32.2	39.67	7.460	54.00	14.33	150	110	AV	PASS
13547.18	27.2	44.25	17.090	-	-	150	10	AV	NA
13632.38	37.6	54.36	16.810	68.23	13.87	150	140	PK	PASS



(Antenna Vertical, 30MHz to 1GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
43.34	48.4	20.43	-27.960	40.00	19.57	150	110	PK	PASS
90.51	54.5	23.06	-31.460	43.50	20.44	150	30	PK	PASS
104.46	51.4	22.00	-29.440	43.50	21.50	150	250	PK	PASS
321.28	39.3	14.35	-24.910	46.00	31.65	150	270	PK	PASS
641.90	40.0	23.18	-16.790	46.00	22.82	150	120	PK	PASS
967.86	40.0	28.63	-11.360	54.00	25.37	150	170	PK	PASS

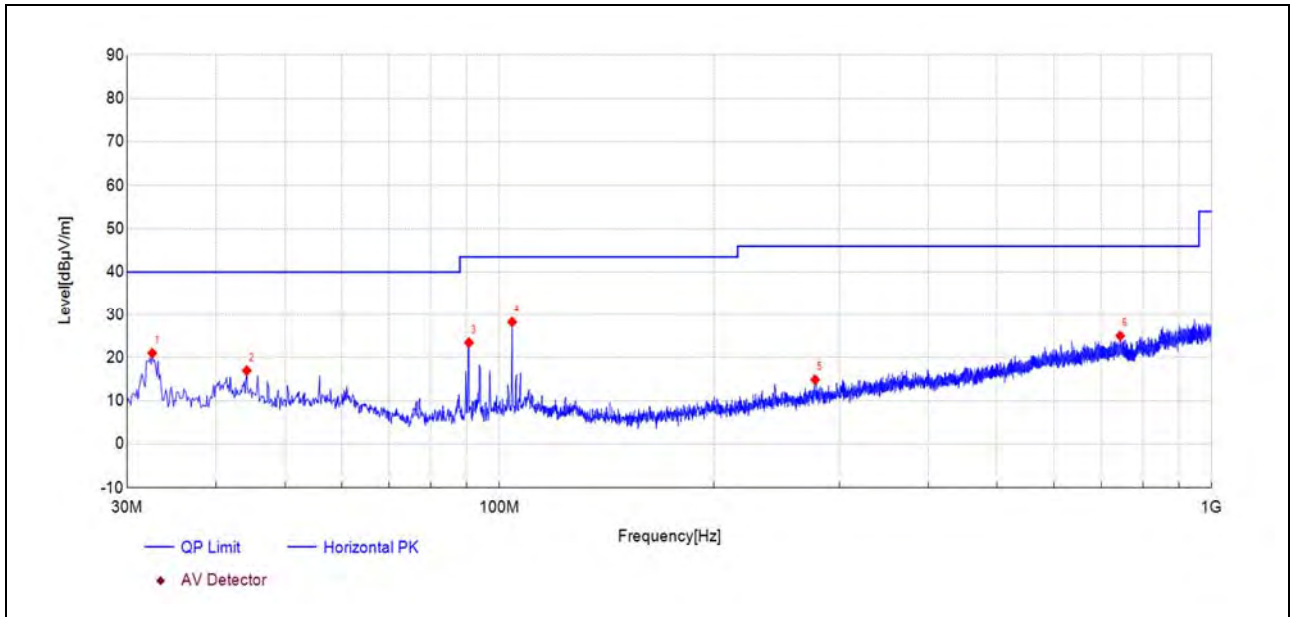


(Antenna Vertical, 1GHz to 18GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
1422.53	40.2	40.38	0.220	74.00	33.62	150	220	PK	PASS
1431.46	30.0	30.31	0.300	-	-	150	120	AV	NA
2460.82	41.7	48.23	6.550	68.23	20.00	150	360	PK	PASS
2461.53	35.3	41.84	6.540	-	-	150	360	AV	NA
3732.34	38.5	49.68	11.150	74.00	24.32	150	310	PK	PASS
3819.84	27.2	38.80	11.650	54.00	15.20	150	60	AV	PASS
5719.98	24.9	44.36	19.450	-	-	150	290	AV	NA
5722.48	35.3	54.77	19.450	68.23	13.46	150	70	PK	PASS
11133.86	40.5	53.99	13.530	74.00	20.01	150	240	PK	PASS
11198.06	30.1	43.61	13.500	54.00	10.39	150	140	AV	PASS
13555.58	37.8	54.90	17.090	68.23	13.33	150	300	PK	PASS
13612.58	27.4	44.35	17.000	-	-	150	290	AV	NA

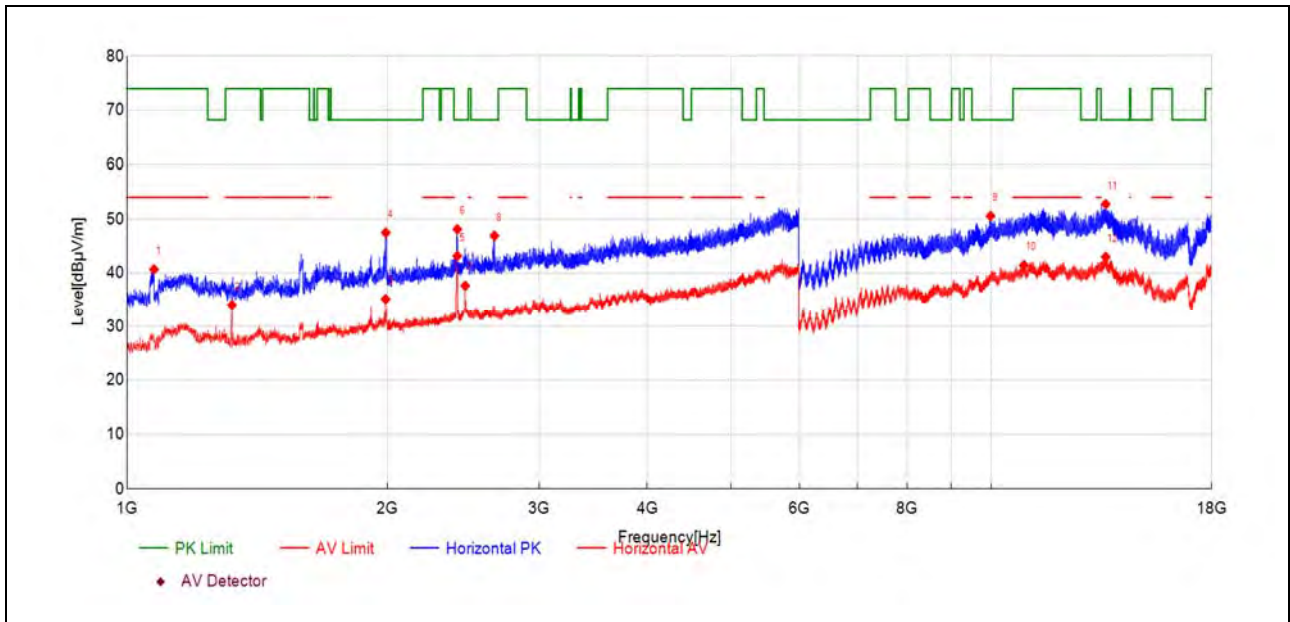


Plot for Channel 157



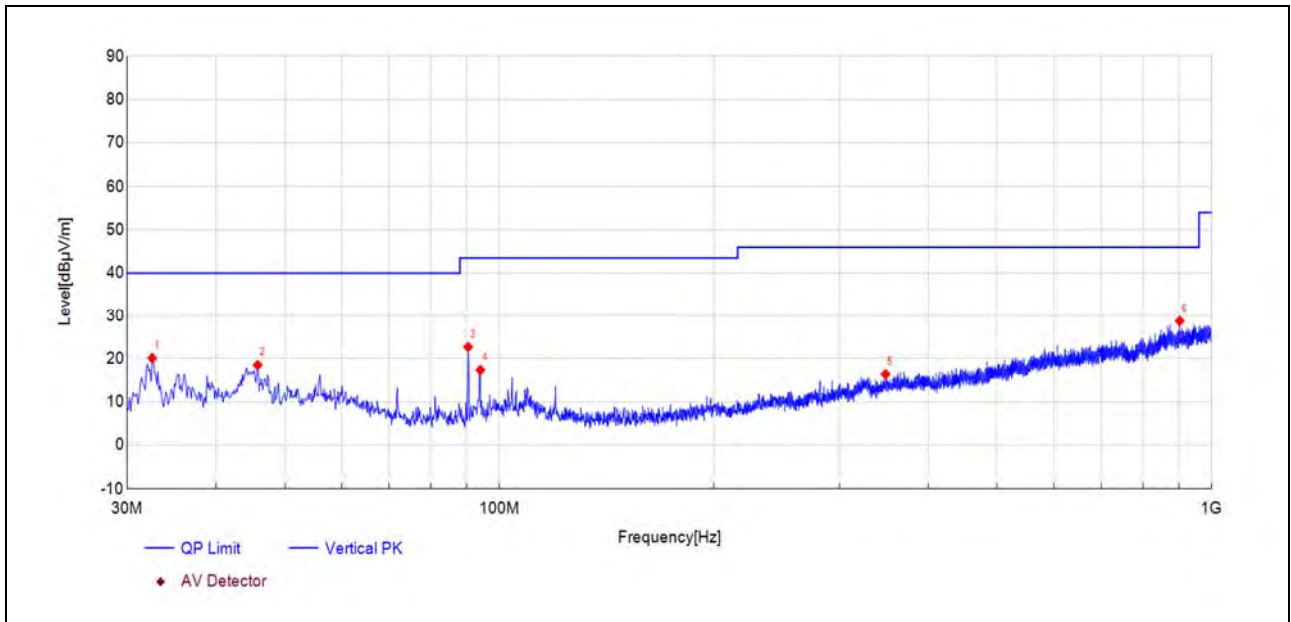
(Antenna Horizontal, 30MHz to 1GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
32.55	51.5	21.02	-30.470	40.00	18.98	150	170	PK	PASS
44.19	44.9	16.99	-27.870	40.00	23.01	150	320	PK	PASS
90.63	54.9	23.45	-31.420	43.50	20.05	150	260	PK	PASS
104.21	57.8	28.26	-29.570	43.50	15.24	150	340	PK	PASS
277.47	41.1	14.87	-26.210	46.00	31.13	150	10	PK	PASS
743.92	40.0	25.00	-14.980	46.00	21.00	150	130	PK	PASS



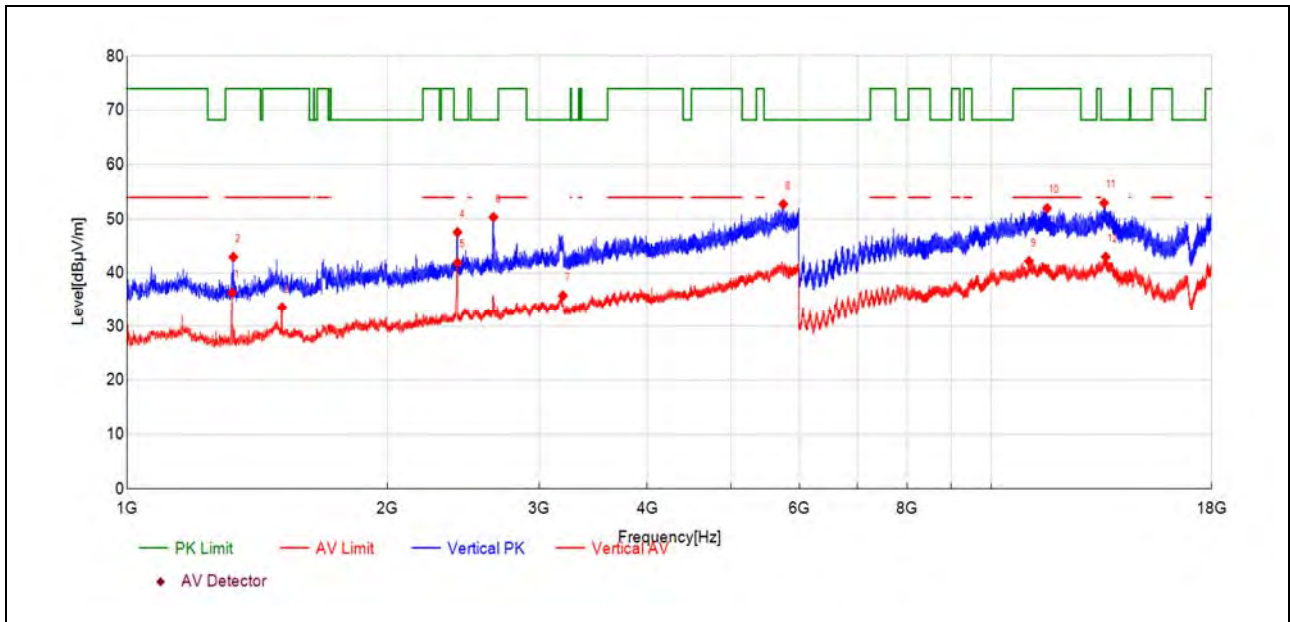
(Antenna Horizontal, 1GHz to 18GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
1074.65	43.1	40.70	-2.360	74.00	33.30	150	10	PK	PASS
1322.88	34.9	34.08	-0.770	54.00	19.92	150	230	AV	PASS
1991.86	32.3	35.16	2.880	-	-	150	350	AV	NA
1992.57	44.6	47.48	2.890	68.23	20.75	150	40	PK	PASS
2410.82	37.5	43.19	5.740	-	-	150	50	AV	NA
2410.82	42.4	48.12	5.740	68.23	20.11	150	10	PK	PASS
2462.60	31.1	37.64	6.550	-	-	150	330	AV	NA
2661.55	40.3	46.91	6.650	68.23	21.32	150	300	PK	PASS
9985.40	40.5	50.58	10.120	68.23	17.65	150	80	PK	PASS
10914.25	28.4	41.46	13.090	54.00	12.54	150	210	AV	PASS
13568.18	35.7	52.77	17.090	68.23	15.46	150	210	PK	PASS
13571.78	25.9	43.01	17.100	-	-	150	330	AV	NA



(Antenna Vertical, 30MHz to 1GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
32.55	50.6	20.10	-30.470	40.00	19.90	150	170	PK	PASS
45.76	46.9	18.50	-28.370	40.00	21.50	150	250	PK	PASS
90.38	54.2	22.68	-31.500	43.50	20.82	150	330	PK	PASS
94.02	47.9	17.36	-30.530	43.50	26.14	150	340	PK	PASS
348.40	40.4	16.40	-23.960	46.00	29.60	150	60	PK	PASS
901.67	40.3	28.75	-11.520	46.00	17.25	150	150	PK	PASS



(Antenna Vertical, 1GHz to 18GHz)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
1322.88	37.1	36.33	-0.770	54.00	17.67	150	70	AV	PASS
1327.52	43.7	42.98	-0.750	74.00	31.02	150	80	PK	PASS
1511.82	33.9	33.61	-0.330	54.00	20.39	150	240	AV	PASS
2412.24	41.8	47.55	5.770	68.23	20.68	150	30	PK	PASS
2412.60	36.2	41.94	5.780	-	-	150	30	AV	NA
2655.12	43.7	50.35	6.700	68.23	17.88	150	180	PK	PASS
3194.44	27.2	35.83	8.610	-	-	150	110	AV	NA
5746.77	33.4	52.76	19.390	68.23	15.47	150	80	PK	PASS
11060.05	29.0	42.20	13.200	54.00	11.80	150	230	AV	PASS
11607.88	37.8	52.00	14.220	74.00	22.00	150	230	PK	PASS
13512.98	35.9	52.98	17.070	68.23	15.25	150	80	PK	PASS
13571.18	25.9	43.01	17.090	-	-	150	200	AV	NA

————— END OF REPORT —————