

DFS Test Report

Report No.: RFBCKS-WTW-P23090477A-1

FCC ID: 2AWHPR232

Test Model: UTR-232

Received Date: 2023/9/21

Test Date: 2023/11/16 ~ 2023/11/29

Issued Date: 2023/12/15

Applicant: Space Exploration Technologies Corp. (SPACEX)

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
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**FCC Registration /
Designation Number:** 723255 / TW2022



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Table of Contents

Release Control Record	3
1 Certificate of Conformity	4
2 EUT Information	5
2.1 Operating Frequency Bands and Mode of EUT	5
2.2 EUT Software and Firmware Version	5
2.3 Description of Available Antennas to the EUT	6
2.4 EUT Maximum and Minimum Conducted Power	7
2.5 EUT Maximum and Minimum EIRP Power	7
2.6 Transmit Power Control (TPC)	8
2.7 Statement of Manufacturer	8
3. U-NII DFS Rule Requirements	9
3.1 Working Modes and Required Test Items	9
3.2 Test Limits and Radar Signal Parameters	10
4. Test & Support Equipment List	13
4.1 Test Instruments	13
4.2 Description of Support Units	13
5. Test Procedure	14
5.1 DFS Measurement System	14
5.2 Calibration of DFS Detection Threshold Level	15
5.3 Deviation from Test Standard	15
5.4 Radiated Test Setup Configuration	16
6. Test Results	17
6.1 Summary of Test Results	17
6.2 Test Results	18
6.2.1 Test Mode: Device operating in Master Mode	18
6.2.2 U-NII Detection Bandwidth	28
6.2.3 Channel Availability Check Time	42
6.2.4 Channel Closing Transmission and Channel Move Time	46
6.2.5 Non- Occupancy Period	107
7. Information of the Testing Laboratories	111
APPENDIX-A	112

Release Control Record

Issue No.	Description	Date Issued
RFBCKS-WTW-P23090477A-1	Original release.	2023/12/15

1 Certificate of Conformity

Product: Starlink Router

Brand: SPACEX



Test Model: UTR-232

Sample Status: Engineering sample

Applicant: Space Exploration Technologies Corp. (SPACEX)

Test Date: 2023/11/16 ~ 2023/11/29

Standards: FCC Part 15, Subpart E (Section 15.407)

References Test Guidance: KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Vito Lung , **Date:** 2023/12/15
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Approved by : May Chen , **Date:** 2023/12/15
May Chen / Manager

2 EUT Information

2.1 Operating Frequency Bands and Mode of EUT

Table 1: Operating Frequency Bands and Mode of EUT

Operational Mode	Operating Frequency Range	
	5250~5350MHz	5470~5725MHz
Master	✓	✓

2.2 EUT Software and Firmware Version

Table 2: The EUT Software/Firmware Version

No.	Product	Model No.	Software/Firmware Version
1	Starlink Router	UTR-232	DFS_CERT_20230918

2.3 Description of Available Antennas to the EUT

Table 3: Antenna List:

Antenna No.	RF Chain No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type
2G1	Ant1	4.49	2.4~2.4835	PIFA	ipex(MHF)
2G2	Ant2	4.89	2.4~2.4835	PIFA	ipex(MHF)
2G3	Ant3	2.63	2.4~2.4835	PIFA	ipex(MHF)
2G4	Ant4	4.88	2.4~2.4835	PIFA	ipex(MHF)
5L1	Ant1	4.35	5.15~5.25	PIFA	ipex(MHF)
		3.70	5.25~5.35		
5L2	Ant2	3.27	5.15~5.25	PIFA	ipex(MHF)
		3.09	5.25~5.35		
5L3	Ant3	4.22	5.15~5.25	PIFA	ipex(MHF)
		4.22	5.25~5.35		
5L4	Ant4	2.82	5.15~5.25	PIFA	ipex(MHF)
		2.56	5.25~5.35		
5H1	Ant1	5.14	5.47~5.725	PIFA	ipex(MHF)
		5.65	5.725~5.85		
5H2	Ant2	4.87	5.47~5.725	PIFA	ipex(MHF)
		4.26	5.725~5.85		
5H3	Ant3	5.46	5.47~5.725	PIFA	ipex(MHF)
		5.48	5.725~5.85		
5H4	Ant4	4.76	5.47~5.725	PIFA	ipex(MHF)
		4.33	5.725~5.85		

◆ The directional gain table:

Frequency Range (GHz)	Directional Antenna Gain (dBi)	Antenna Type	Connector Type
2.4~2.4835	7.17	PIFA	ipex(MHF)
5.15 ~ 5.25	7.09	PIFA	ipex(MHF)
5.25 ~ 5.35	7.01	PIFA	ipex(MHF)
5.47 ~ 5.725	6.57	PIFA	ipex(MHF)
5.725 ~ 5.85	7.21	PIFA	ipex(MHF)

*Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

2.4 EUT Maximum and Minimum Conducted Power

Table 4: The Measured Conducted Output Power

CDD Mode

Frequency Band (MHz)	MAX. Power		MIN. Power	
	Output Power (mW)	Output Power (dBm)	Output Power (mW)	Output Power (dBm)
5250~5350	239.857	23.8	60.256	17.80
5470~5725	240.313	23.81	60.395	17.81

Beamforming Mode

Frequency Band (MHz)	MAX. Power		MIN. Power	
	Output Power (mW)	Output Power (dBm)	Output Power (mW)	Output Power (dBm)
5250~5350	195.895	22.92	49.204	16.92
5470~5725	213.074	23.29	53.58	17.29

2.5 EUT Maximum and Minimum EIRP Power

Table 5: The EIRP Output Power List

CDD Mode

Frequency Band (MHz)	MAX. EIRP Power		MIN. EIRP Power	
	Output Power (mW)	Output Power (dBm)	Output Power (mW)	Output Power (dBm)
5250~5350	633.800	28.02	159.221	22.02
5470~5725	844.845	29.27	212.324	23.27

Beamforming Mode

Frequency Band (MHz)	MAX. EIRP Power		MIN. EIRP Power	
	Output Power (mW)	Output Power (dBm)	Output Power (mW)	Output Power (dBm)
5250~5350	984.064	29.93	247.172	23.93
5470~5725	967.232	29.86	243.22	23.86

2.6 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.

Applicable	EIRP	FCC 15.407 (h)(1)
√	>500mW	The TPC mechanism is required for system with an EIRP of above 500mW
	<500mW	The TPC mechanism is not required for system with an EIRP of less 500mW

The UUT can adjust a transmitter's output power based on the signal level present at the receiver. TPC is auto controlled by software.

2.7 Statement of Manufacturer

Manufacturer statement confirming that information regarding the parameters of the detected Radar Waveforms is not available to the end user.

3. U-NII DFS Rule Requirements

3.1 Working Modes and Required Test Items

The manufacturer shall state whether the UUT is capable of operating as a Master and/or a Client. If the UUT is capable of operating in more than one operating mode then each operating mode shall be tested separately. See tables 6 and 7 for the applicability of DFS requirements for each of the operational modes.

Table 6: Applicability of DFS Requirements Prior to Use a Channel

Requirement	Operational Mode		
	Master	Client without radar detection	Client with radar detection
Non-Occupancy Period	✓	✓ note	✓
DFS Detection Threshold	✓	Not required	✓
Channel Availability Check Time	✓	Not required	Not required
U-NII Detection Bandwidth	✓	Not required	✓

Note: Per KDB 905462 D03 UNII Clients Without Radar Detection New Rules v01r02 section (b)(5/6), 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. An analyzer plot that contains a single 30-minute sweep on the original channel.

Table 7: Applicability of DFS Requirements during Normal Operation

Requirement	Operational Mode	
	Master or Client with radar detection	Client without radar detection
DFS Detection Threshold	✓	Not required
Channel Closing Transmission Time	✓	✓
Channel Move Time	✓	✓
U-NII Detection Bandwidth	✓	Not required

Additional requirements for devices with multiple bandwidth modes	Master 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.

3.2 Test Limits and Radar Signal Parameters

Detection Threshold Values

Table 8: 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 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt 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.

Table 9: 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.

Parameters of DFS Test Signals

Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table 10: Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A 15 unique PRI values randomly selected from the list of 23 PRI values 15 unique PRI values randomly selected within the range of 518~3066 μsec with a minimum of 1 μsec, excluding PRI values selected in Test A	Roundup $\left\{ \left\lceil \frac{1}{360} \right\rceil \cdot \left\lceil \frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right\rceil \right\}$	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

Table 11: Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses Per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Three subsets of trials will be performed with a minimum of ten trials per subset. The subset of trials differ in where the Long Pulse Type 5 Signal is tuned in frequency.

a) the Channel center frequency

b) tuned frequencies such that 90% of the Long Pulse Type 5 frequency modulation is within the low edge of the UUT Occupied Bandwidth

c) tuned frequencies such that 90% of the Long Pulse Type 5 frequency modulation is within the high edge of the UUT Occupied Bandwidth

It include 10 trails for every subset, the formula as below,

For subset case 1: the center frequency of the signal generator will remain fixed at the center of the UUT Channel.

For subset case 2: to retain 90% frequency overlap between the radar signal and the UUT Occupied Bandwidth, the center frequency of the signal generator will vary for each of the ten trials in subset case 2. The center frequency of the signal generator for each trial is calculated by:

$$FL + (0.4 * \text{Chirp Width [in MHz]})$$

For subset case 3: to retain 90% frequency overlap between the radar signal and the UUT Occupied Bandwidth, the center frequency of the signal generator will vary for each of the ten trials in subset case 3. The center frequency of the signal generator for each trial is calculated by:

$$FH - (0.4 * \text{Chirp Width [in MHz]})$$

Table 12: Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

4. Test & Support Equipment List

4.1 Test Instruments

Table 13: Test Instruments List

Description & Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Signal Analyzer R&S	FSV40	101516	2023/2/10	2024/2/9
MXG Vector Signal Generator Agilent	N5182B	MY53051263	2023/8/4	2024/8/3
Programmable Step Attenuator Agilent	8496H-001	8496H-001_04	2023/11/3	2024/11/2
Horn Antenna ChamPro	1018G	0001	2023/11/12	2024/11/11

Notes:

1. The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in DFS-1 room.
3. Tested Date: 2023/11/16 ~ 2023/11/29

4.2 Description of Support Units

Table 14: Support Unit Information

No.	Product	Brand	Model No.	FCC ID	Spec
1	Wireless-AX6000 Dual Band Gigabit Router	ASUS	RT-AX88U	MSQ- RTAXHP00	The maximum EIRP is 29.97 dBm, Antenna Gain is 2.24dBi

NOTE: This device was functioned as a ☐ Master ☒ Client device during the DFS test.

Table 15: Software/Firmware Information

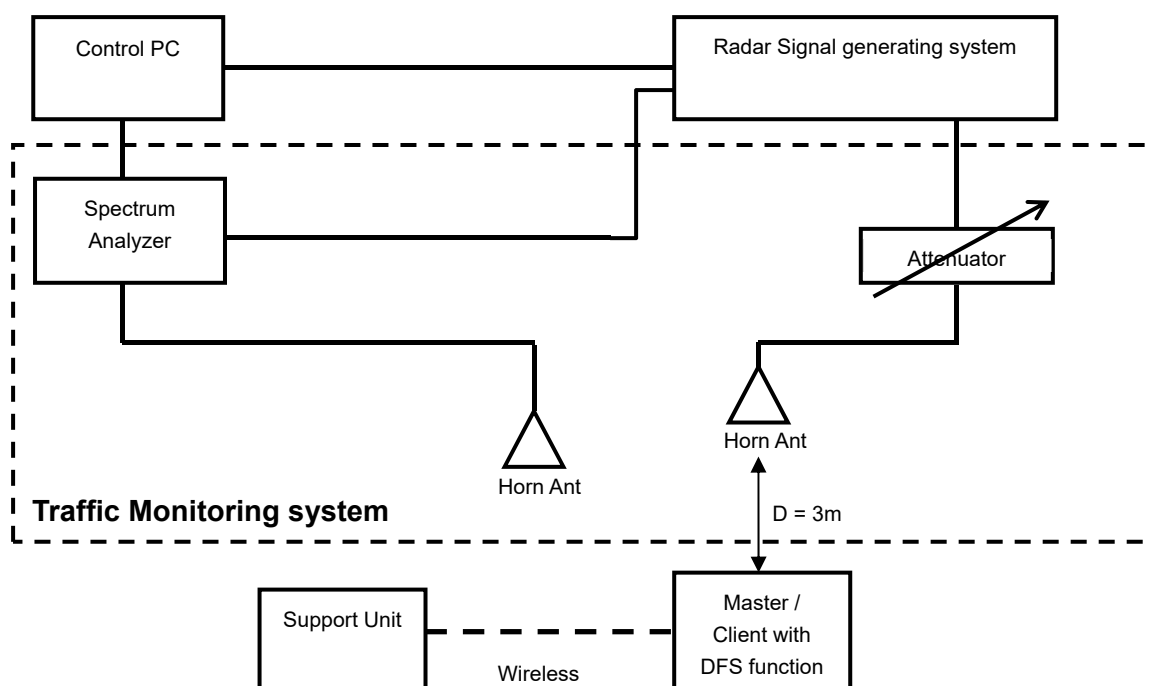
No.	Product	Model No.	Software/Firmware Version
1	Wireless-AX6000 Dual Band Gigabit Router	RT-AX88U	3.0.0.4.384

5. Test Procedure

5.1 DFS Measurement System

A complete DFS Measurement System consists of two subsystems: (1) the Radar Signal Generating system and (2) the Traffic Monitoring system. The control PC is necessary for generating the Radar waveforms in Table 10, 11 and 12. The traffic monitoring subsystem is specified to the type of unit under test (UUT).

Radiated Setup Configuration of DFS Measurement System



Channel Loading

System testing will be performed with channel-loading using means appropriate to the data types that are used by the unlicensed device. The following requirements apply:

a)	The data file must be of a type that is typical for the device (i.e., MPEG-2, MPEG-4, WAV, MP3, MP4, AVI, etc.) and must generally be transmitting in a streaming mode.	
b)	Software to ping the client is permitted to simulate data transfer but must have random ping intervals.	
c)	Timing plots are required with calculations demonstrating a minimum channel loading of approximately 17% or greater.	✓
d)	Unicast or Multicast protocols are preferable but other protocols may be used. The appropriate protocol used must be described in the test procedures.	

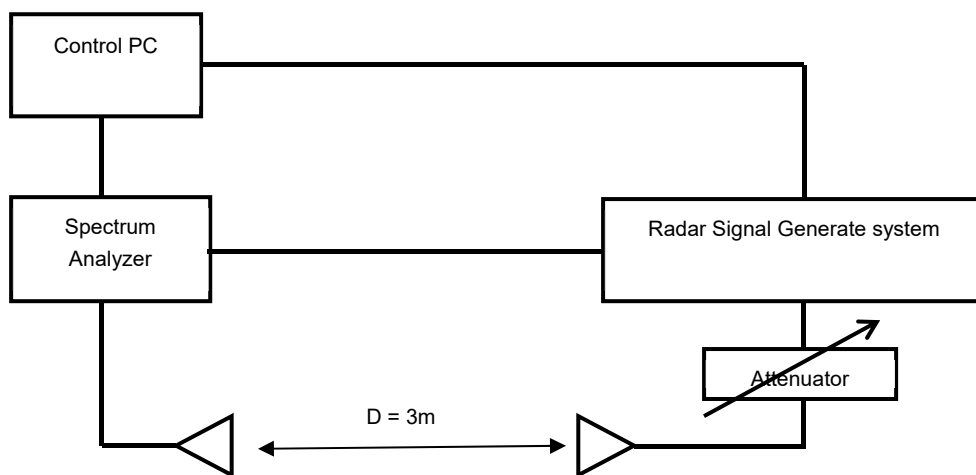
5.2 Calibration of DFS Detection Threshold Level

The measured channel is chosen from the operating channels of the UUT within the 5250-5350MHz or 5470-5725MHz and using the all bandwidth mode available for the link. The radar signal was the same as transmitted channels, and injected into the antenna of AP (master) or Client Device with Radar Detection, measured the channel closing transmission time and channel move time.

Radiated setup configuration of Calibration of DFS Detection Threshold Level

The radar signal generate system is generating waveform pattern of radar types. The amplitude of the radar signal generator system is adjusted to yield a level of -64 dBm as measured on the spectrum analyzer.

The interference detection threshold level is lower than -64dBm hence it provides margin to the limit.



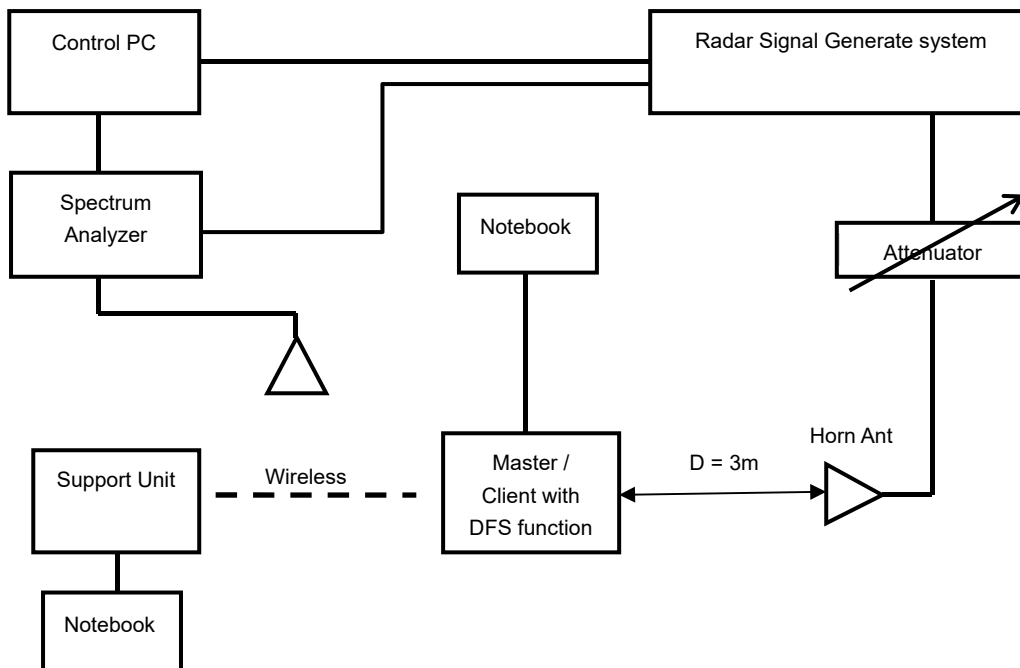
5.3 Deviation from Test Standard

No deviation.

5.4 Radiated Test Setup Configuration

Master mode

The EUT is a U-NII Device operating in Master mode. The radar test signals are injected into the Master Device.



Note: The UUT main beam of the antenna is directly toward the radar emitter during testing.

6. Test Results

6.1 Summary of Test Results

Clause	Test Parameter	Remarks	Pass/Fail
15.407	DFS Detection Threshold	Applicable	Pass
15.407	Channel Availability Check Time	Applicable	Pass
15.407	Channel Move Time	Applicable	Pass
15.407	Channel Closing Transmission Time	Applicable	Pass
15.407	Non- Occupancy Period	Applicable	Pass
15.407	U-NII Detection Bandwidth and Statistical Performance Check	Applicable	Pass

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. This device does not support "802.11ax Channel Puncturing" function.

6.2 Test Results

6.2.1 Test Mode: Device operating in Master Mode

The radar test waveforms are injected into the Master.

5G_Low

This test was investigated for different bandwidth (20MHz · 40MHz · 80MHz and 160MHz).
The following plots was done on 160MHz as a representative.

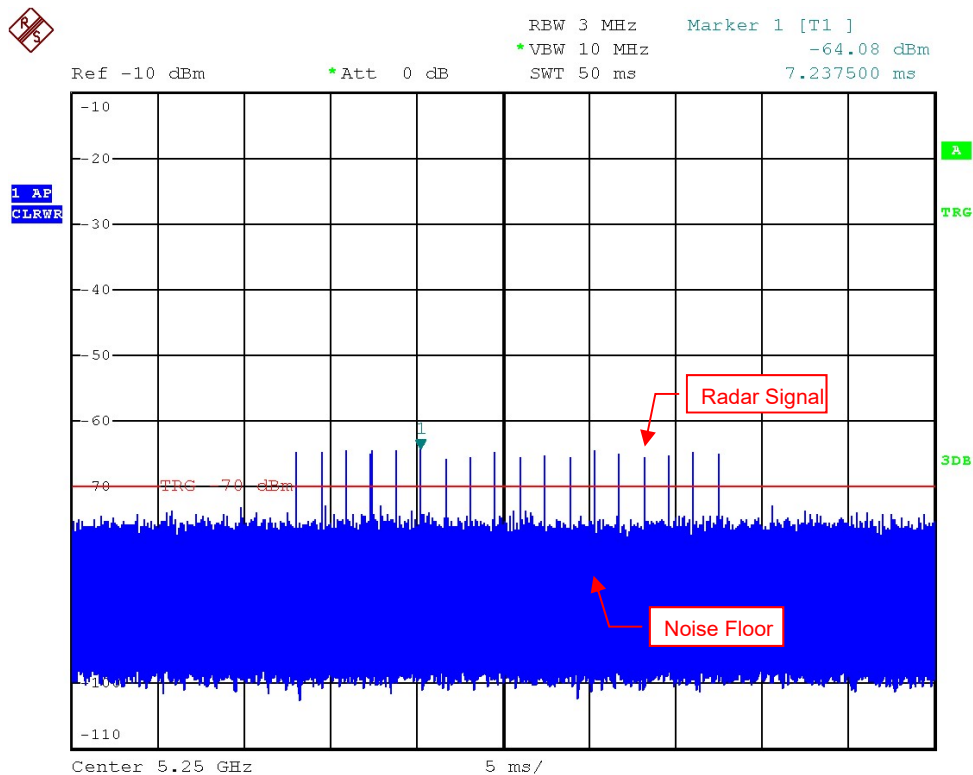
5G_High

This test was investigated for different bandwidth (20MHz · 40MHz and 80MHz).
The following plots was done on 80MHz as a representative.

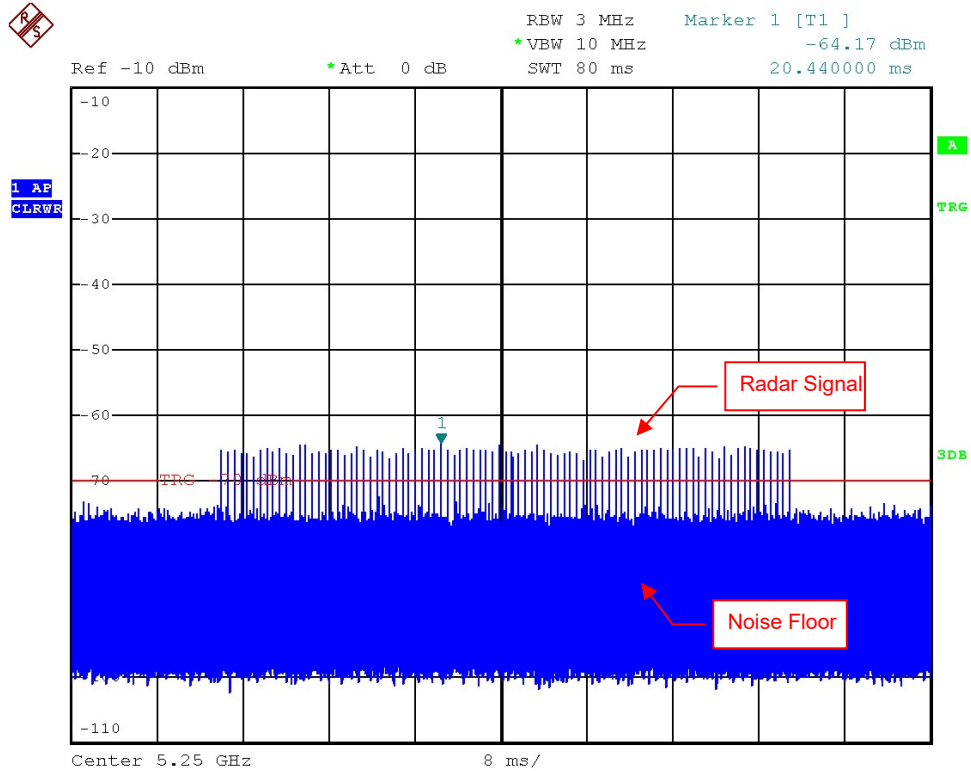
DFS Detection Threshold

For detection threshold level of -64dBm, the tested level is lower than required level for 1dB, hence it provides margin to the limit.

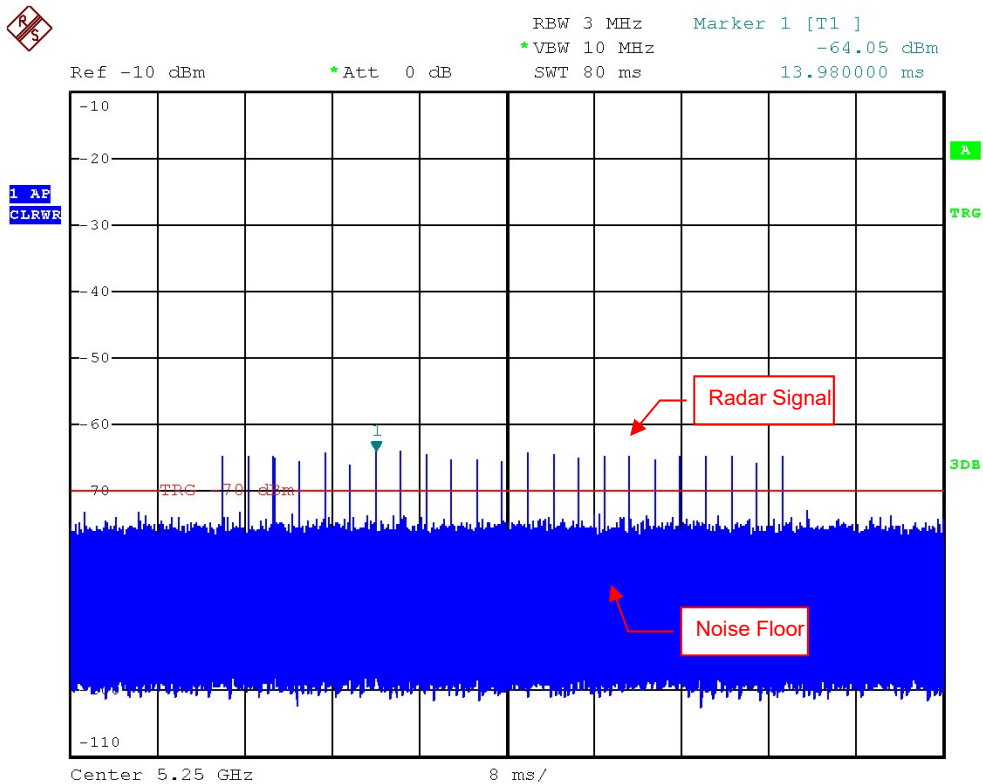
5G_Low



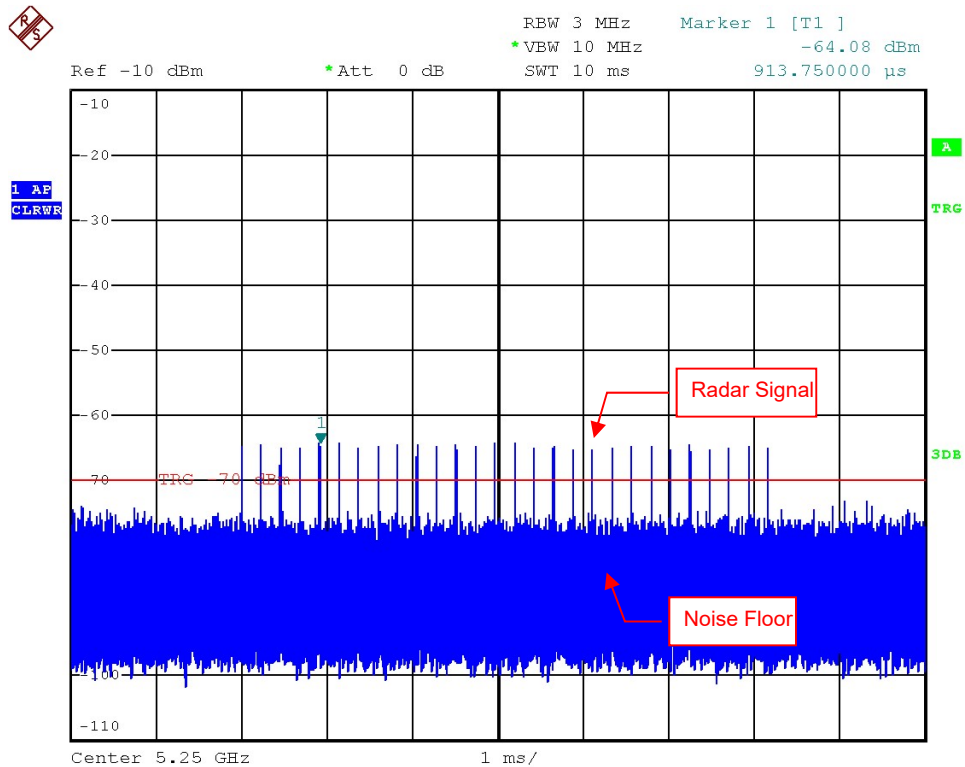
Radar Signal 0



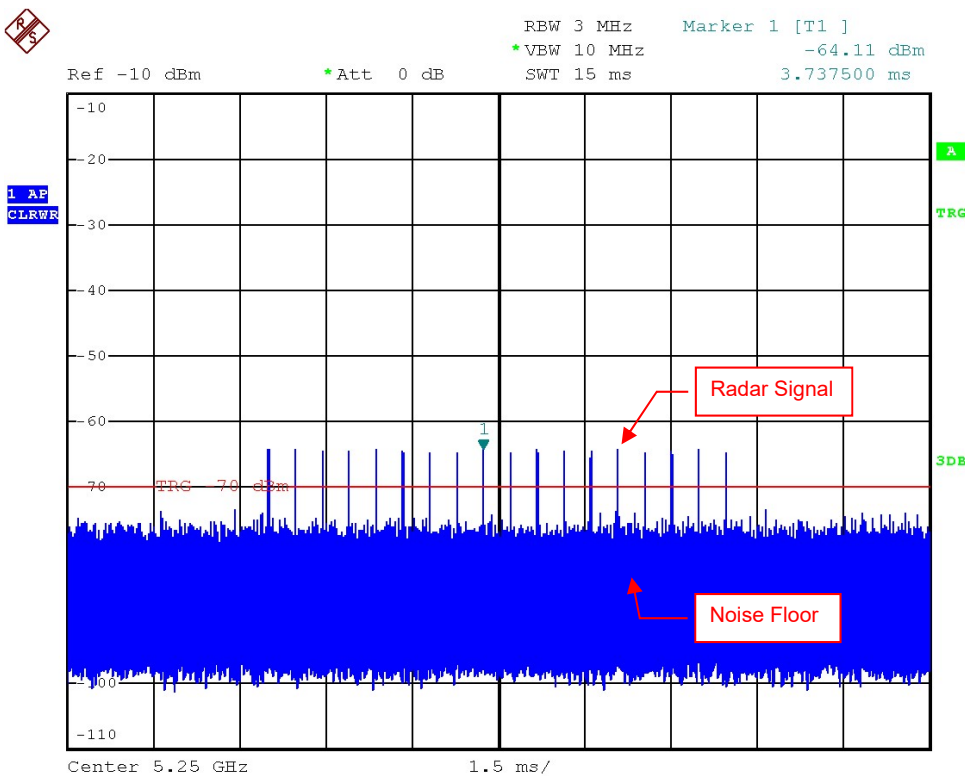
Radar Signal 1 (Test A)



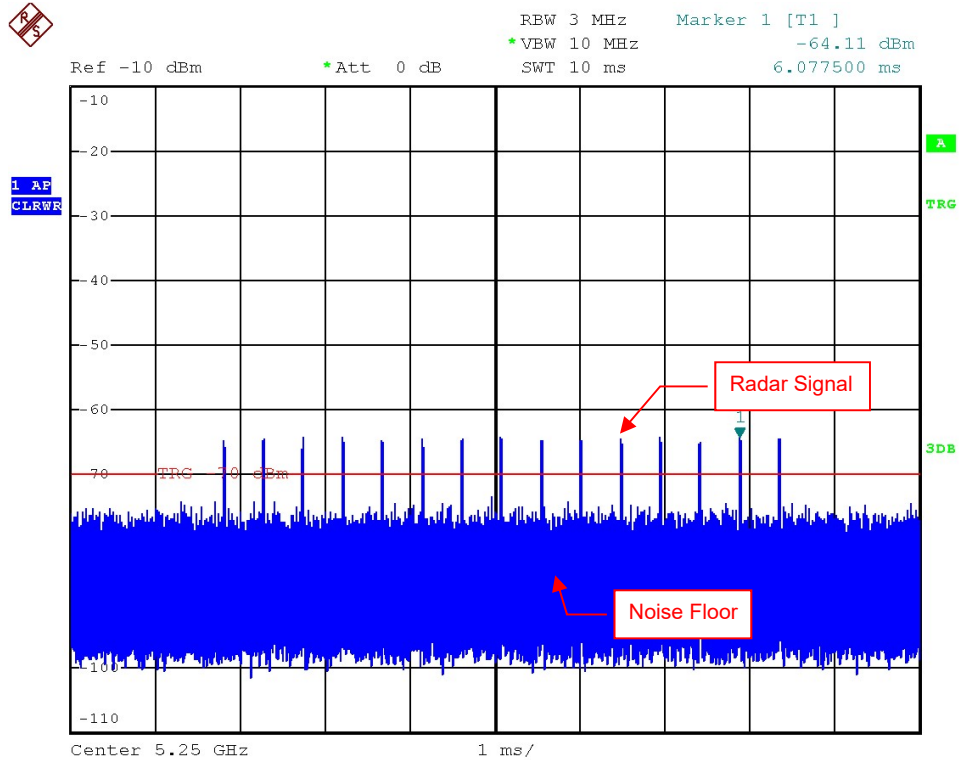
Radar Signal 1 (Test B)



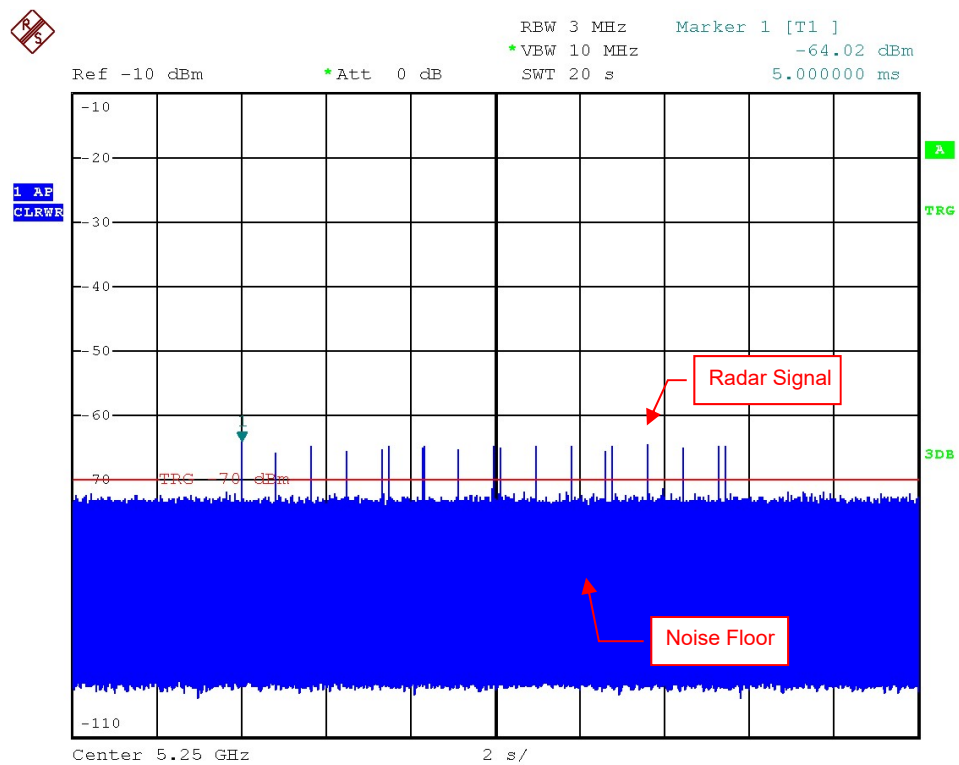
Radar Signal 2



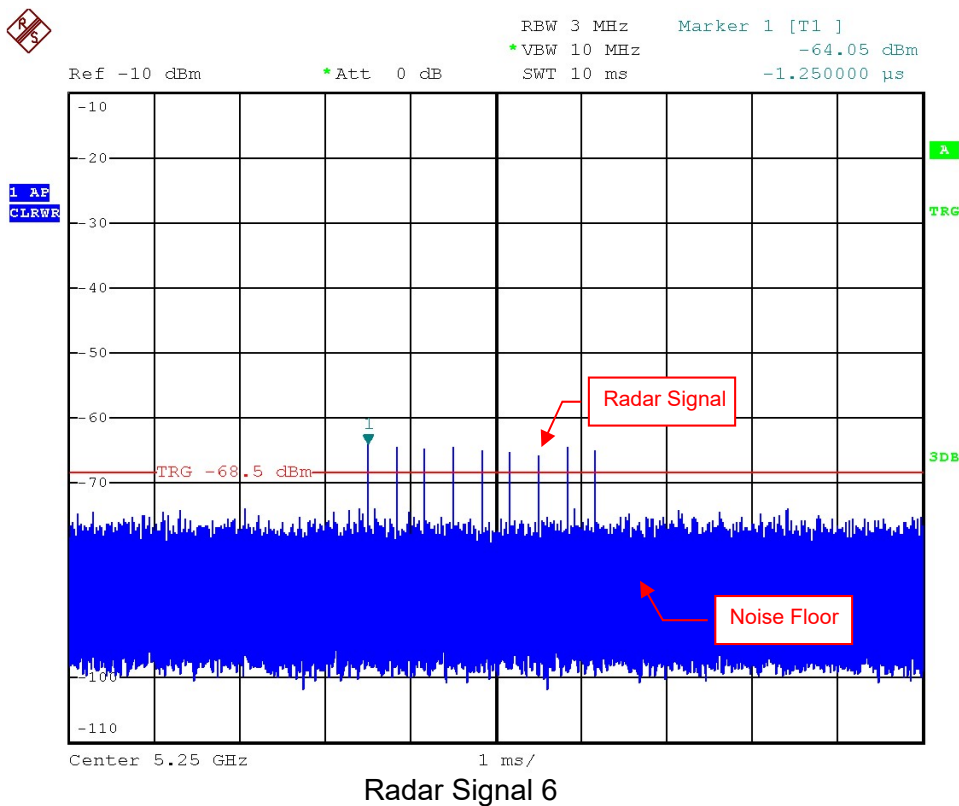
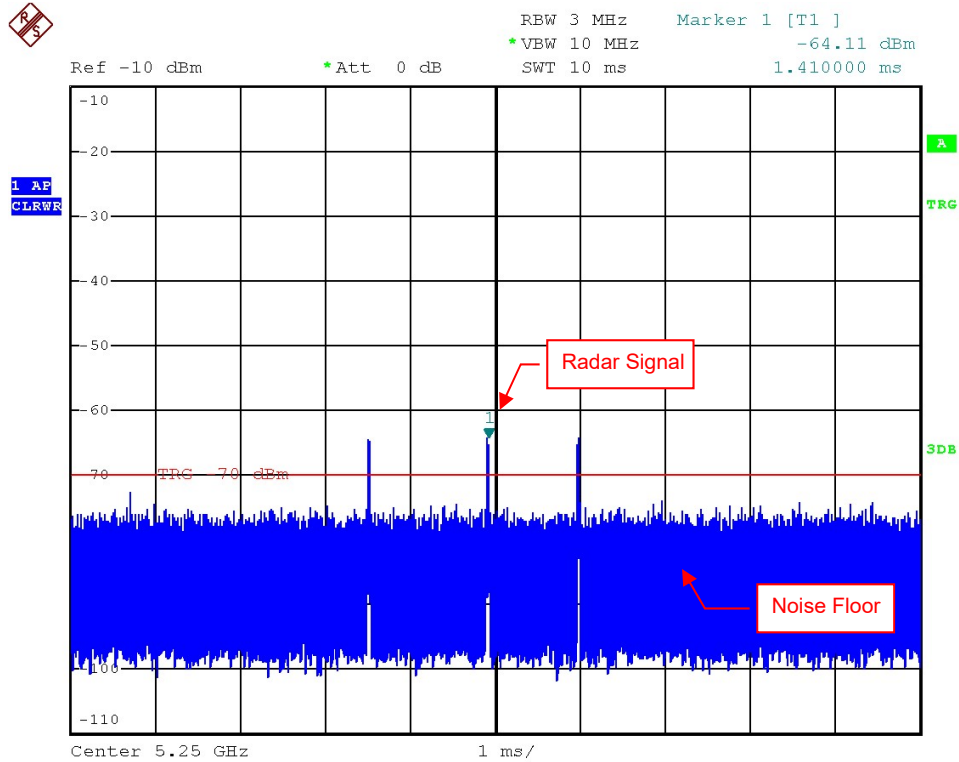
Radar Signal 3



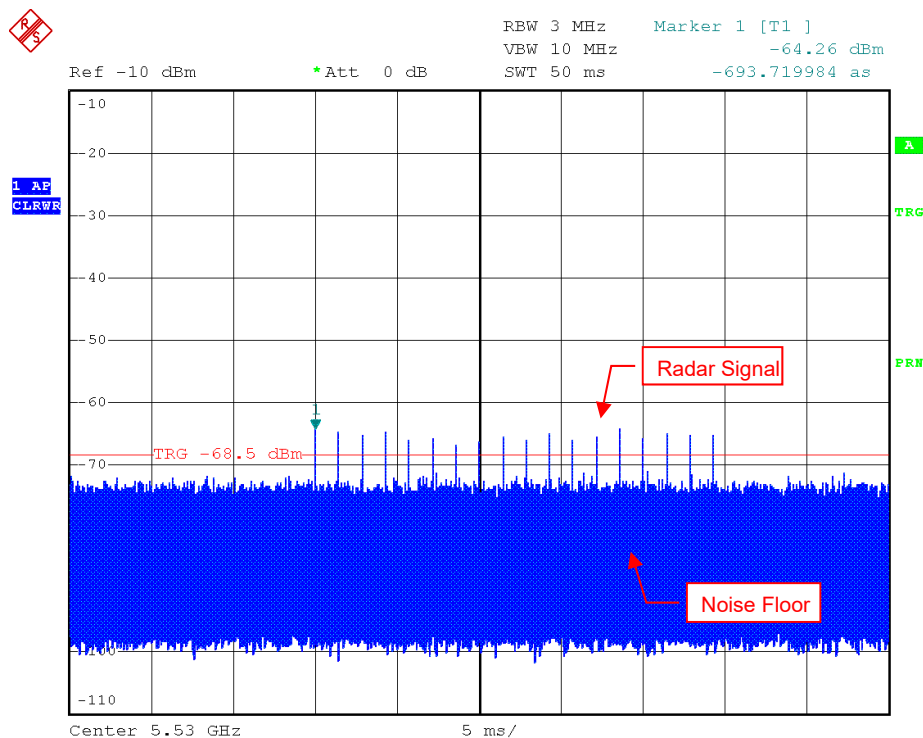
Single Burst of Radar Signal 4



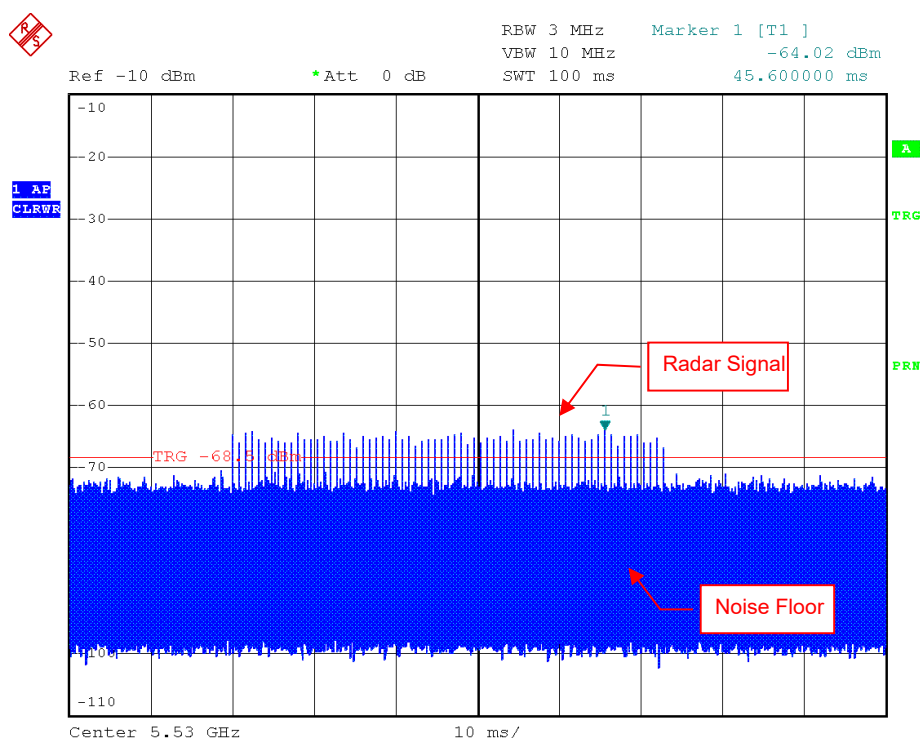
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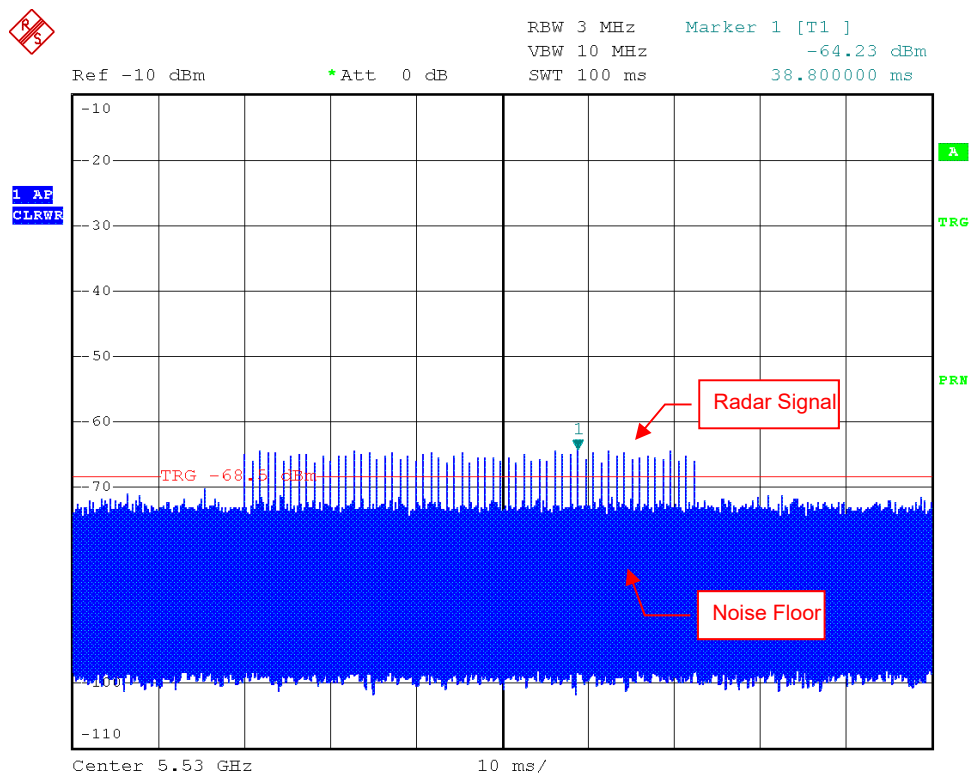
5G_High



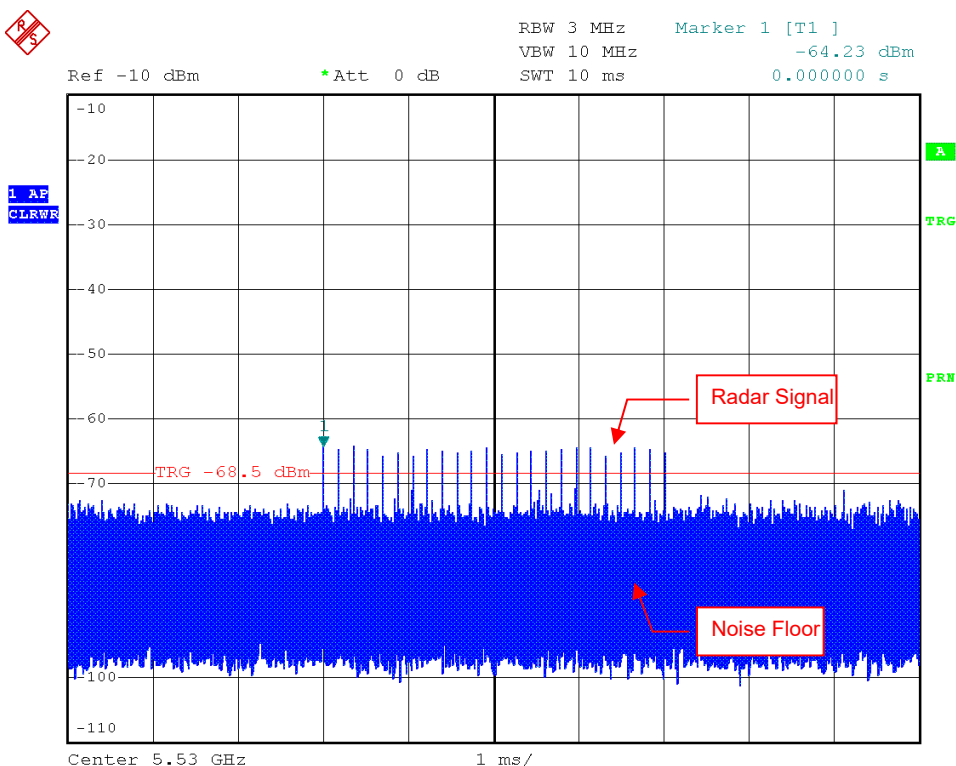
Radar Signal 0



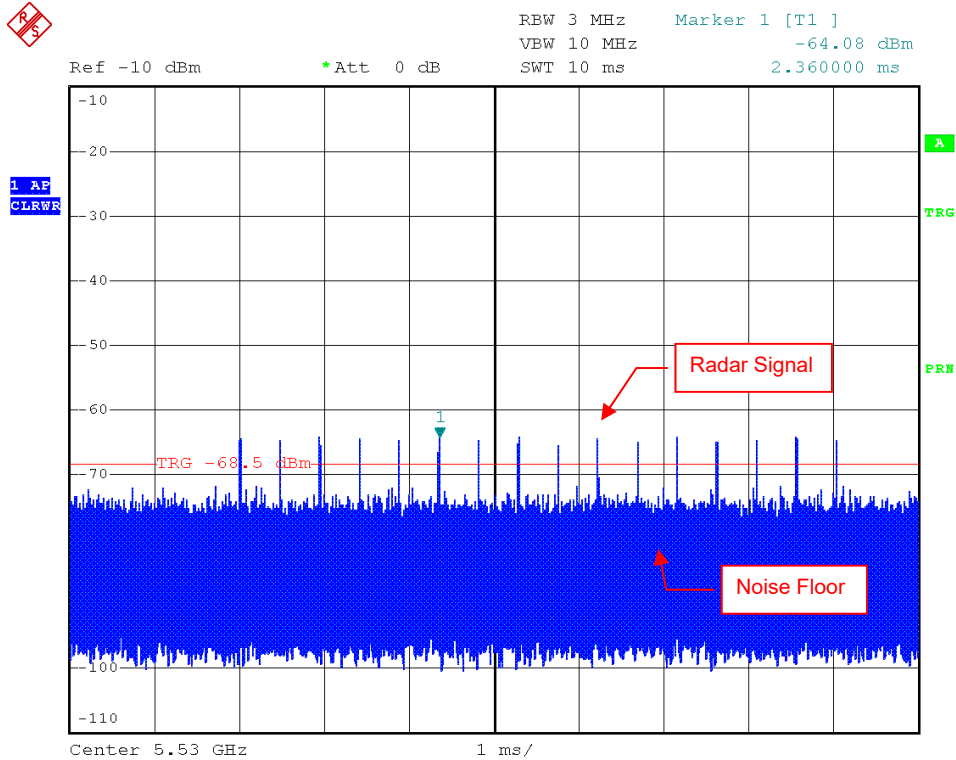
Radar Signal 1 (Test A)



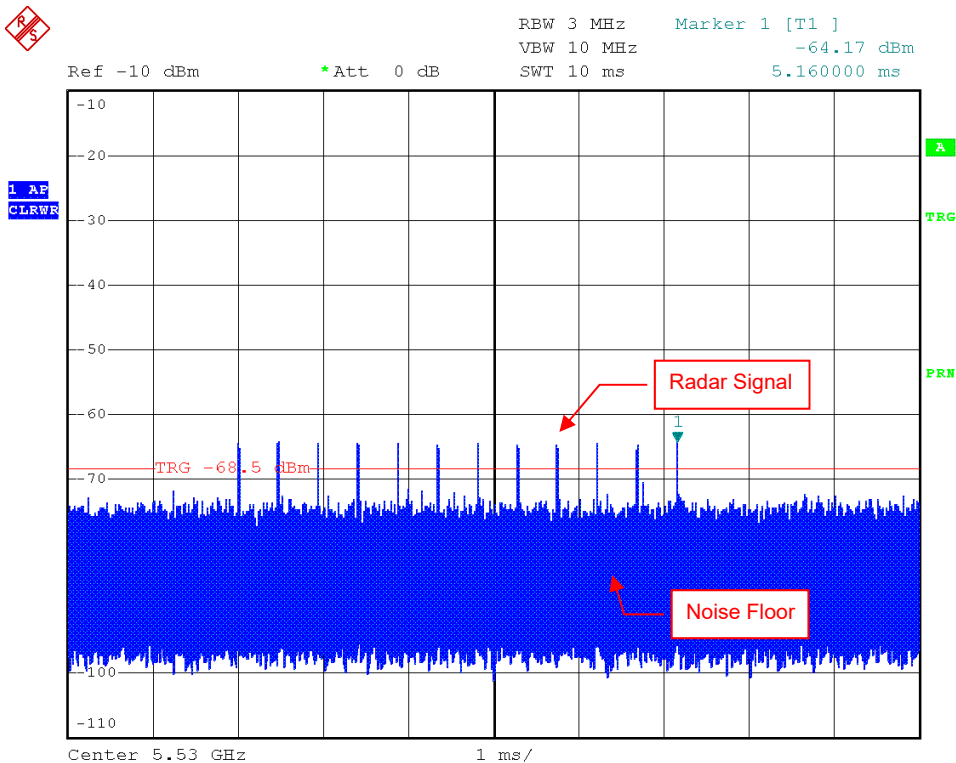
Radar Signal 1 (Test B)



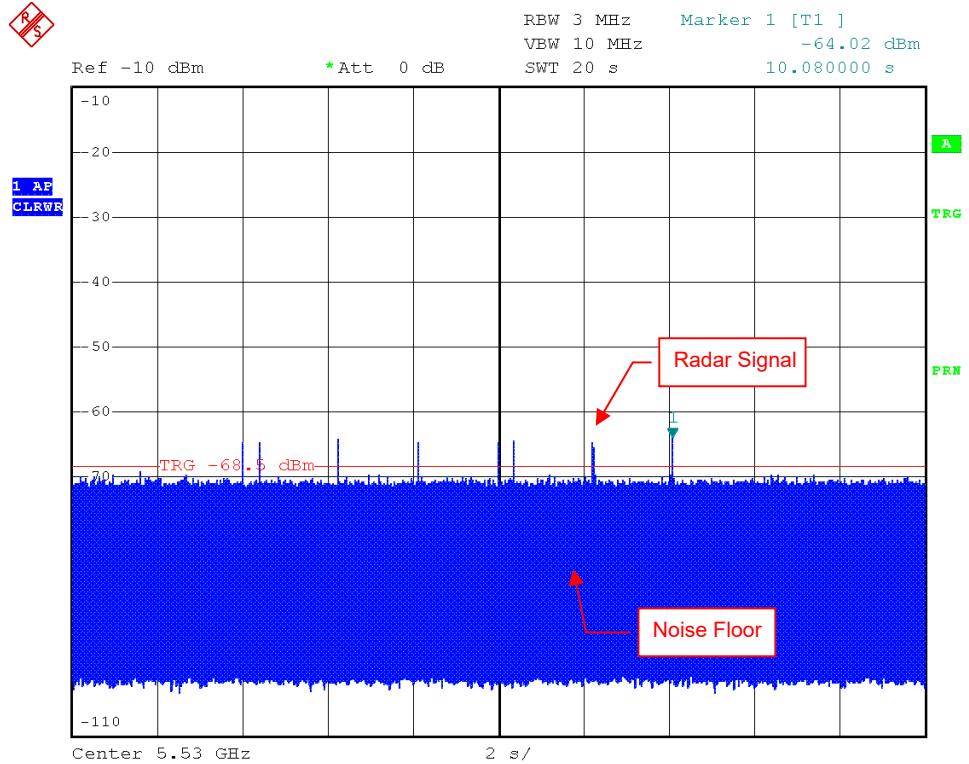
Radar Signal 2



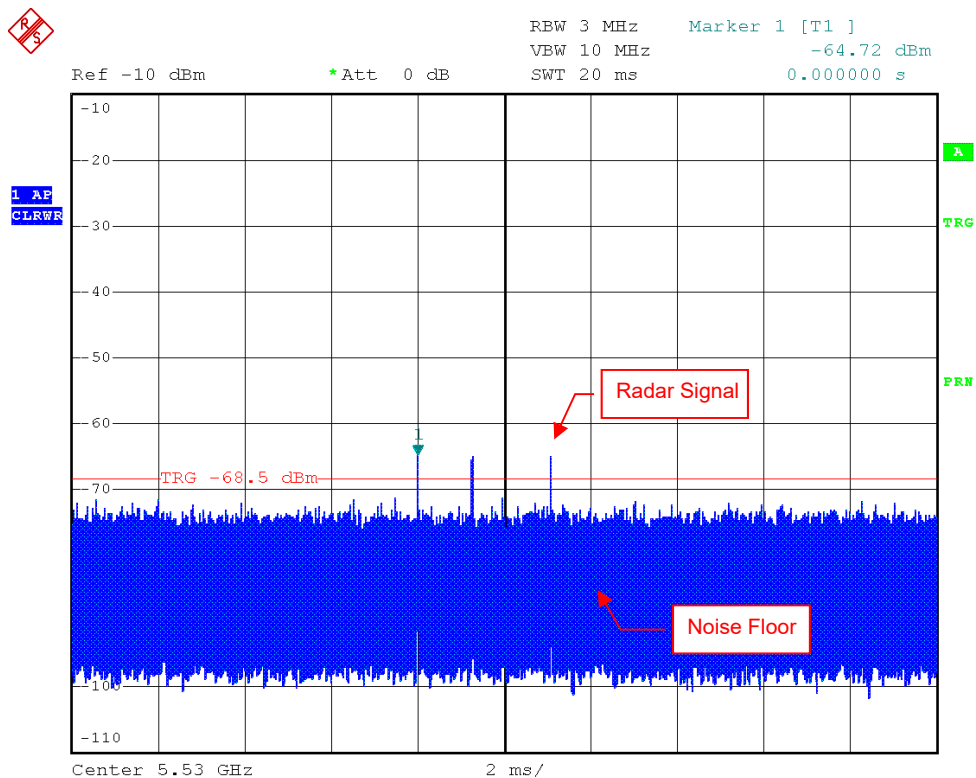
Radar Signal 3



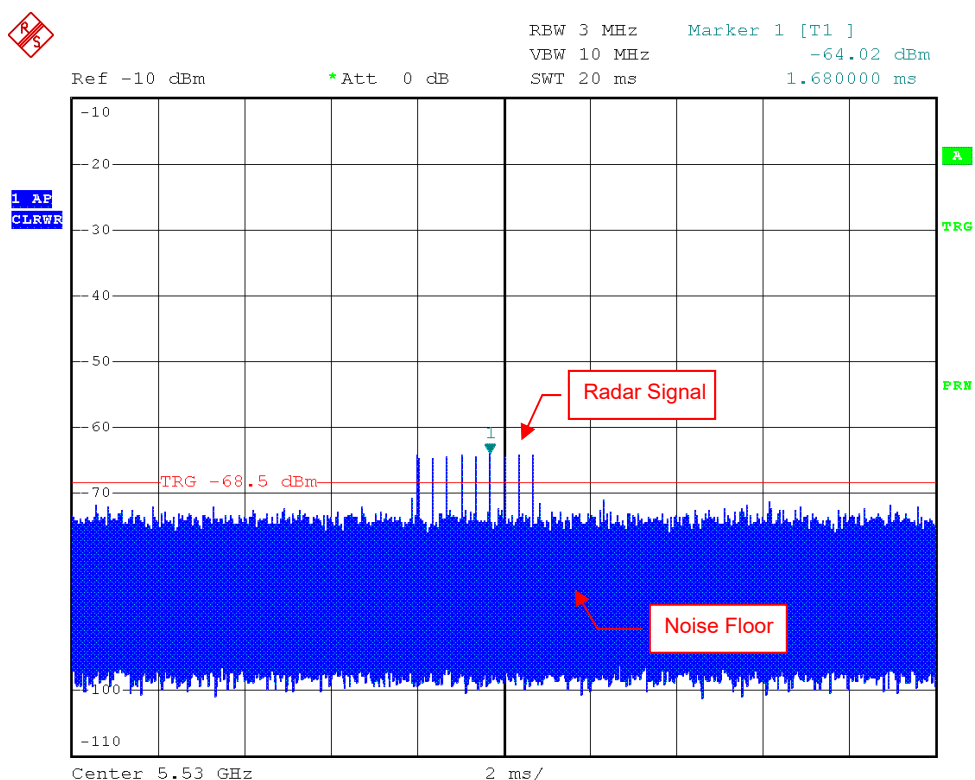
Single Burst of Radar Signal 4



Radar Signal 5



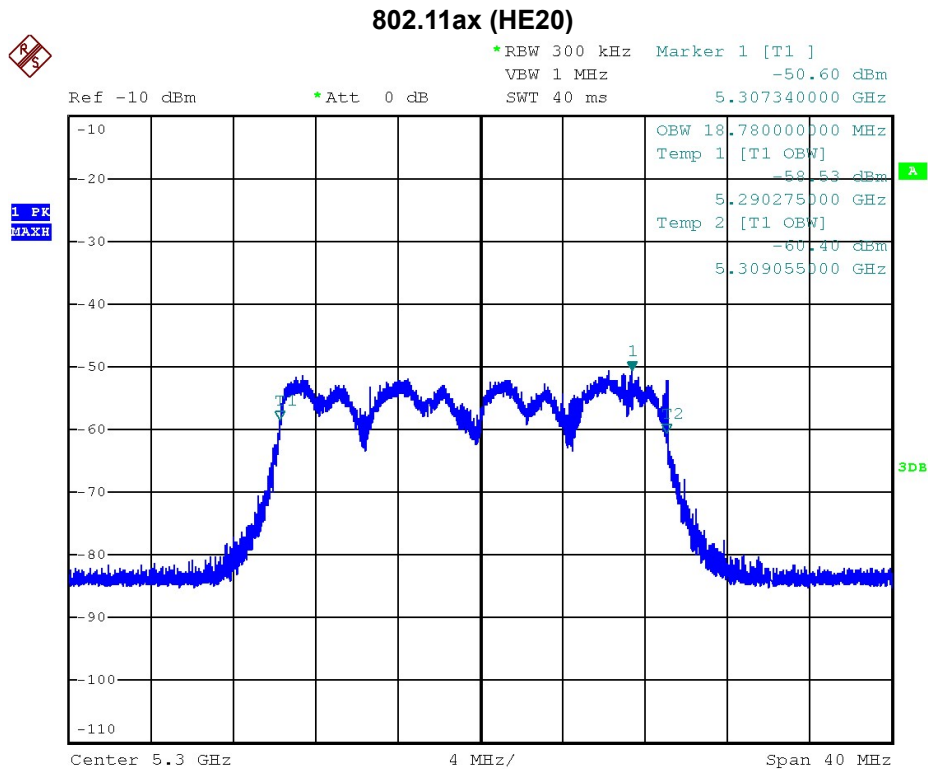
Single Burst of Radar Signal 5



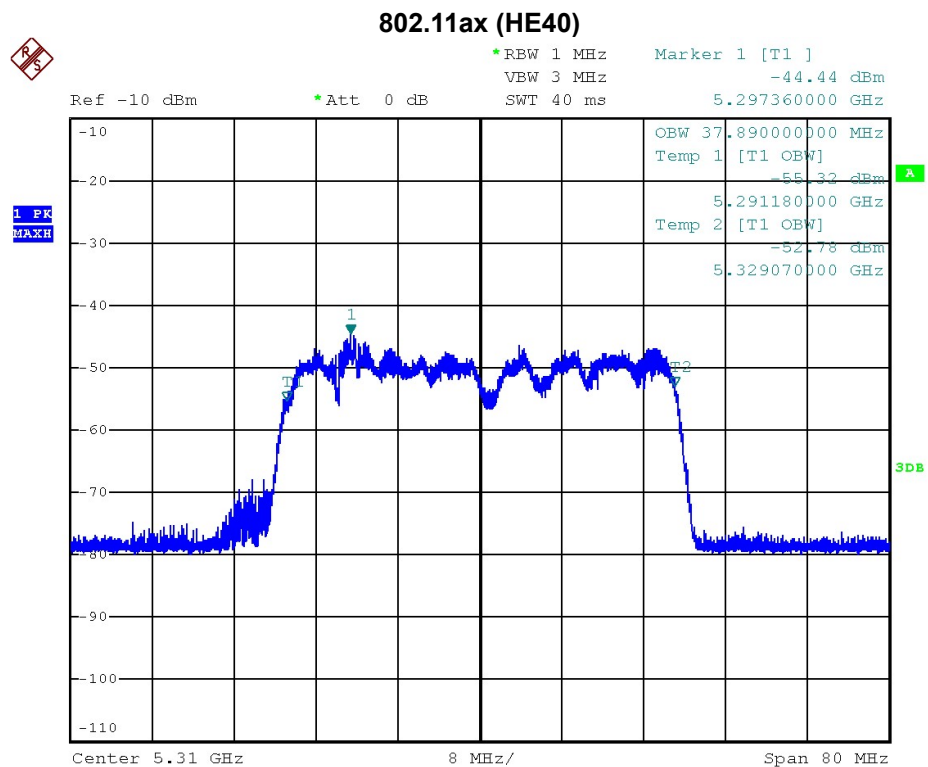
Radar Signal 6

6.2.2 U-NII Detection Bandwidth

5G_Low

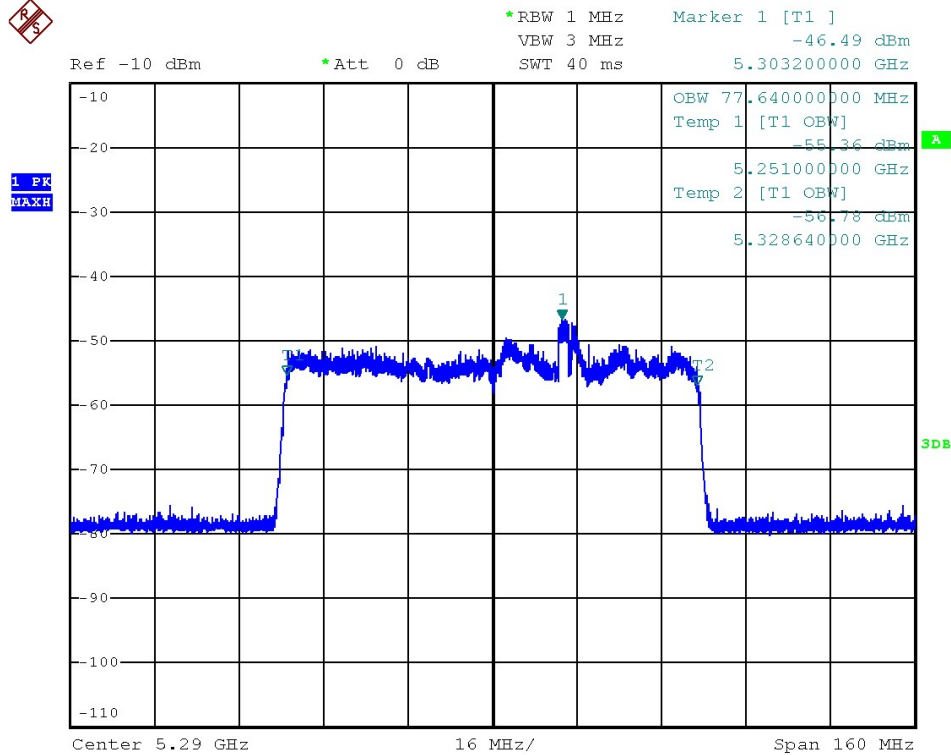


U-NII 99% Channel bandwidth



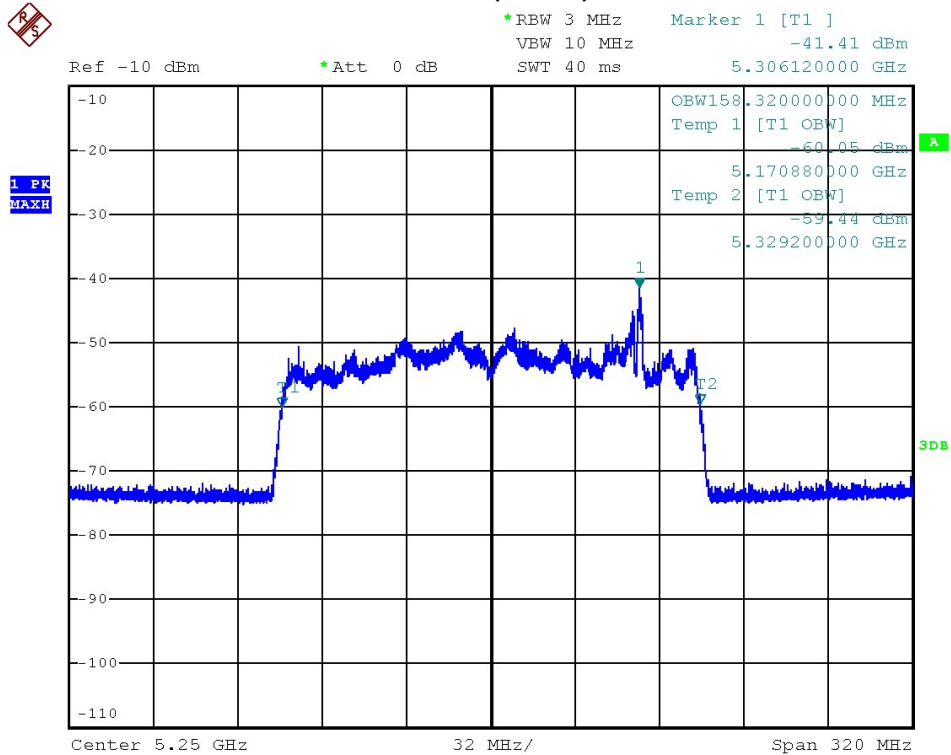
U-NII 99% Channel bandwidth

802.11ax (HE80)



U-NII 99% Channel bandwidth

802.11ax (HE160)



U-NII 99% Channel bandwidth

5G_Low

Detection Bandwidth Test - 802.11ax (HE20)											
Radar Type 0											
EUT Frequency: 5300MHz											
EUT 99% Power bandwidth: 18.78MHz											
Detection bandwidth limit (100% of EUT 99% Power bandwidth): 18.78MHz											
Detection bandwidth (5310(FH) – 5290(FL)) : 20MHz											
Test Result : PASS											
Radar Frequency (MHz)	Trial Number / Detection										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5290 (FL)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5291	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5292	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5293	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5294	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5295	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5296	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5297	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5298	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5299	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5300	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5301	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5302	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5303	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5304	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5305	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5306	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5307	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5308	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5309	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5310 (FH)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100

Detection Bandwidth Test - 802.11ax (HE40)

Radar Type 0

EUT Frequency: 5310MHz

EUT 99% Power bandwidth: 37.89MHz

Detection bandwidth limit (100% of EUT 99% Power bandwidth): 37.89MHz

Detection bandwidth (5329(FH) – 5291(FL)) : 38MHz

Test Result : PASS

Radar Frequency (MHz)	Trial Number / Detection										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5291 (FL)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5292	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5293	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5294	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5295	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5296	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5297	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5298	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5299	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5300	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5301	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5302	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5303	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5304	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5305	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5306	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5307	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5308	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5309	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5310	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5311	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5312	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5313	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5314	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5315	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5316	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5317	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5318	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5319	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5320	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5321	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5322	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5323	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5324	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5325	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5326	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5327	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5328	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5329 (FH)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100

Detection Bandwidth Test - 802.11ax (HE80)

Radar Type 0

EUT Frequency: 5290MHz

EUT 99% Power bandwidth: 77.64MHz

Detection bandwidth limit (100% of EUT 99% Power bandwidth): 77.64MHz

Detection bandwidth (5329(FH) – 5251(FL)) : 78MHz

Test Result : PASS

Radar Frequency (MHz)	Trial Number / Detection										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5251(FL)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5252	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5253	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5254	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5255	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5256	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5257	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5258	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5259	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5260	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5261	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5262	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5263	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5264	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5265	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5266	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5267	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5268	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5269	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5270	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5271	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5272	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5273	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5274	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5275	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5276	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5277	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5278	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5279	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5280	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5281	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5282	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5283	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5284	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5285	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5286	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5287	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5288	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5289	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5290	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5291	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5292	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5293	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5294	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5295	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5296	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100

5297	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5298	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5299	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5300	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5301	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5302	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5303	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5304	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5305	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5306	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5307	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5308	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5309	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5310	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5311	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5312	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5313	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5314	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5315	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5316	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5317	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5318	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5319	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5320	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5321	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5322	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5323	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5324	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5325	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5326	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5327	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5328	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5329(FH)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100

Detection Bandwidth Test - 802.11ax (HE160)

Radar Type 0

EUT Frequency: 5250MHz

EUT 99% Power bandwidth: 158.32MHz

Detection bandwidth limit (100% of EUT 99% Power bandwidth): 79.16MHz

Detection bandwidth (5330(FH) – 5250(FL)) : 80MHz

(160MHz channel (5250MHz) straddle between 5150~5250 and 5250~5350MHz, the DFS ability is necessary in 5250~5350MHz, therefore DFS detection bandwidth start from 5250MHz for 11ax HE160 mode.)

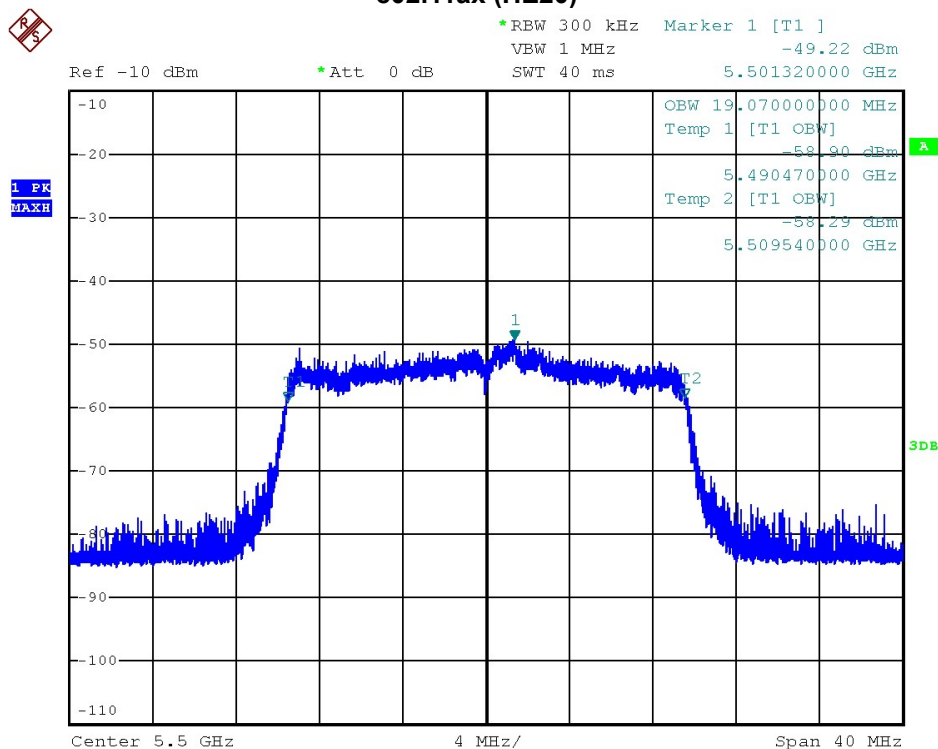
Test Result : PASS

Radar Frequency (MHz)	Trial Number / Detection										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5250 (FL)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5251	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5252	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5253	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5254	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5255	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5256	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5257	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5258	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5259	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5260	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5261	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5262	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5263	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5264	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5265	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5266	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5267	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5268	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5269	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5270	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5271	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5272	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5273	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5274	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5275	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5276	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5277	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5278	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5279	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5280	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5281	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5282	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5283	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5284	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5285	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5286	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5287	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5288	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5289	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5290	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5291	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100

5292	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5293	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5294	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5295	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5296	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5297	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5298	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5299	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5300	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5301	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5302	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5303	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5304	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5305	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5306	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5307	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5308	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5309	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5310	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5311	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5312	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5313	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5314	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5315	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5316	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5317	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5318	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5319	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5320	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5321	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5322	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5323	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5324	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5325	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5326	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5327	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5328	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5329	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5330(FH)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100

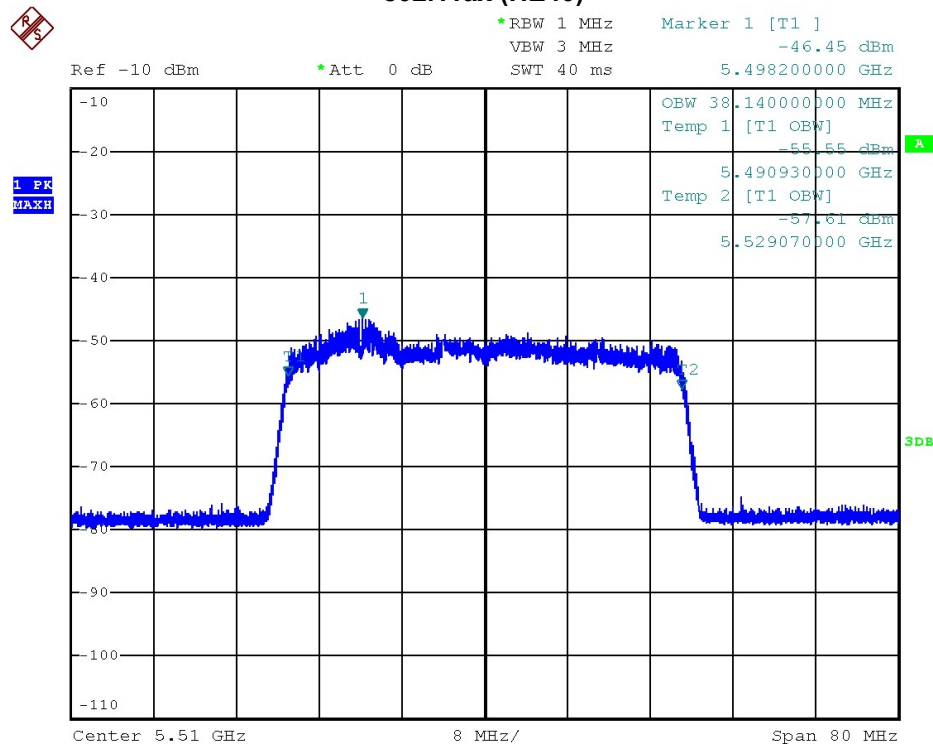
5G_High

802.11ax (HE20)



U-NII 99% Channel bandwidth

802.11ax (HE40)



U-NII 99% Channel bandwidth

802.11ax (HE80)

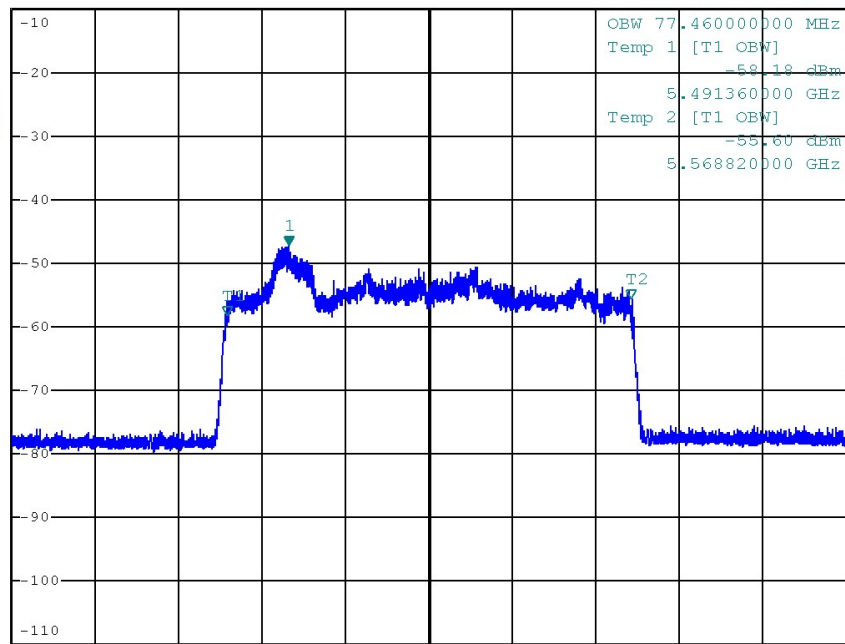


*RBW 1 MHz Marker 1 [T1]
VBW 3 MHz -47.02 dBm
SWT 40 ms 5.503120000 GHz

Ref -10 dBm

*Att 0 dB

1 PK
MAXH



Center 5.53 GHz

16 MHz/

Span 160 MHz

U-NII 99% Channel bandwidth

5G_High

Detection Bandwidth Test - 802.11ax (HE20)											
Radar Type 0											
EUT Frequency: 5500MHz											
EUT 99% Power bandwidth: 19.07MHz											
Detection bandwidth limit (100% of EUT 99% Power bandwidth): 19.07MHz											
Detection bandwidth (5510(FH) – 5490(FL)) : 20MHz											
Test Result : PASS											
Radar Frequency (MHz)	Trial Number / Detection										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5490 (FL)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5491	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5492	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5493	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5494	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5495	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5496	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5497	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	100
5498	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5499	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5500	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5501	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5502	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5503	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5504	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5505	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5506	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5507	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5508	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5509	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5510 (FH)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100

Detection Bandwidth Test - 802.11ax (HE40)											
Radar Type 0											
EUT Frequency: 5510MHz											
EUT 99% Power bandwidth: 38.14MHz											
Detection bandwidth limit (100% of EUT 99% Power bandwidth): 38.14MHz											
Detection bandwidth (5530(FH) – 5490(FL)) : 40MHz											
Test Result : PASS											
Radar Frequency (MHz)	Trial Number / Detection										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5490 (FL)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5491	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5492	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5493	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5494	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5495	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5496	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5497	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5498	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5499	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5500	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5501	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5502	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5503	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5504	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5505	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5506	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5507	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5508	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5509	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5510	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5511	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5512	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5513	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5514	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5515	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5516	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5517	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5518	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5519	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5520	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5521	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5522	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5523	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5524	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5525	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5526	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5527	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5528	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5529	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5530 (FH)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100

Detection Bandwidth Test - 802.11ax (HE80)											
Radar Type 0											
EUT Frequency: 5530MHz											
EUT 99% Power bandwidth: 77.46MHz											
Detection bandwidth limit (100% of EUT 99% Power bandwidth): 77.46MHz											
Detection bandwidth (5569(FH) – 5491(FL)) : 78MHz											
Test Result : PASS											
Radar Frequency (MHz)	Trial Number / Detection										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5491 (FL)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5492	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5493	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5494	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5495	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5496	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5497	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5498	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5499	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5500	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5501	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5502	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5503	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5504	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5505	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5506	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5507	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5508	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5509	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5510	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5511	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5512	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5513	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5514	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5515	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5516	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5517	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5518	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5519	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5520	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5521	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5522	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5523	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5524	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5525	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5526	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5527	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5528	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5529	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5530	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5531	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5532	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5533	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5534	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100



5535	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5536	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5537	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5538	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5539	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5540	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5541	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5542	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5543	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5544	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5545	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5546	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5547	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5548	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5549	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5550	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5551	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5552	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5553	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5554	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5555	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5556	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5557	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5558	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5559	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5560	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5561	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5562	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5563	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5564	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5565	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5566	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5567	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5568	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100
5569 (FH)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100

6.2.3 Channel Availability Check Time

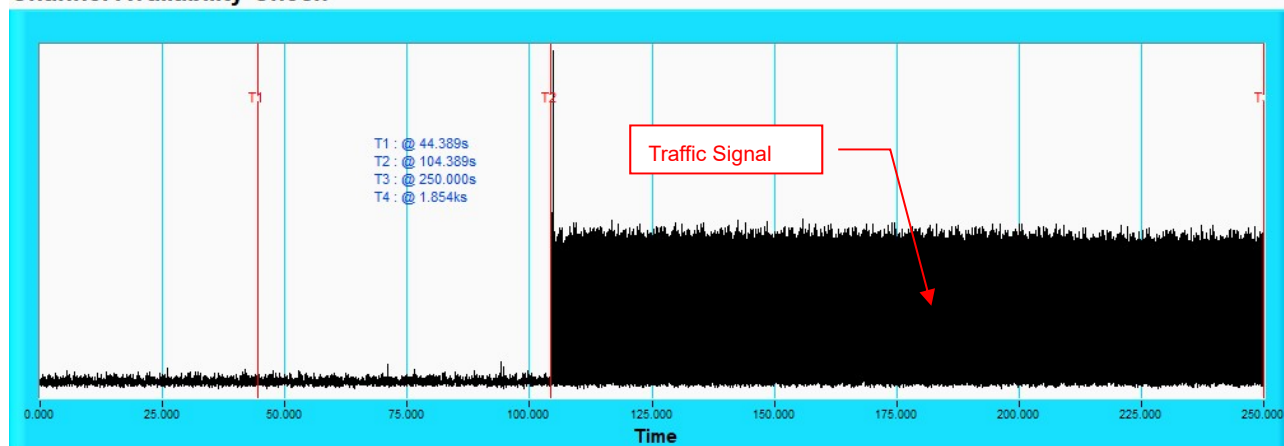
If the EUT successfully detected the radar burst, it should be observed as the EUT has no transmissions occurred until the EUT starts transmitting on another channel.

Timing of Radar Signal	Observation	
	EUT	Spectrum Analyzer
Within 1 to 6 second	Detected	No transmissions
Within 54 to 60 second	Detected	No transmissions

5G_Low

Initial Channel Availability Check Time

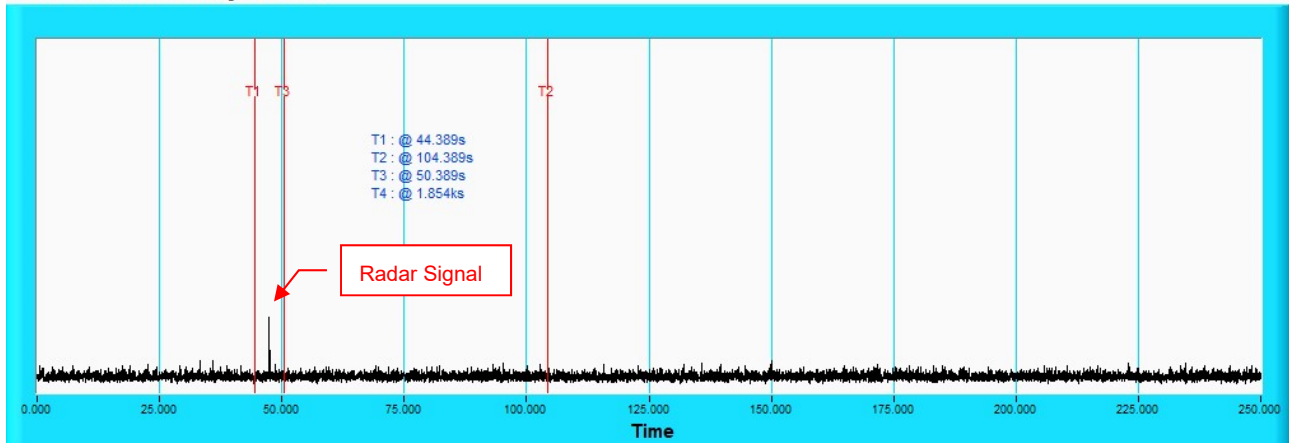
Channel Availability Check



NOTE: T1 denotes the end of power-up time period is 44.389th second. T2 denotes the end of Channel Availability Check time is 104.389th second. Channel Availability Check time is equal to (T2 – T1) 60 seconds.

Radar Burst at the Beginning of the Channel Availability Check Time

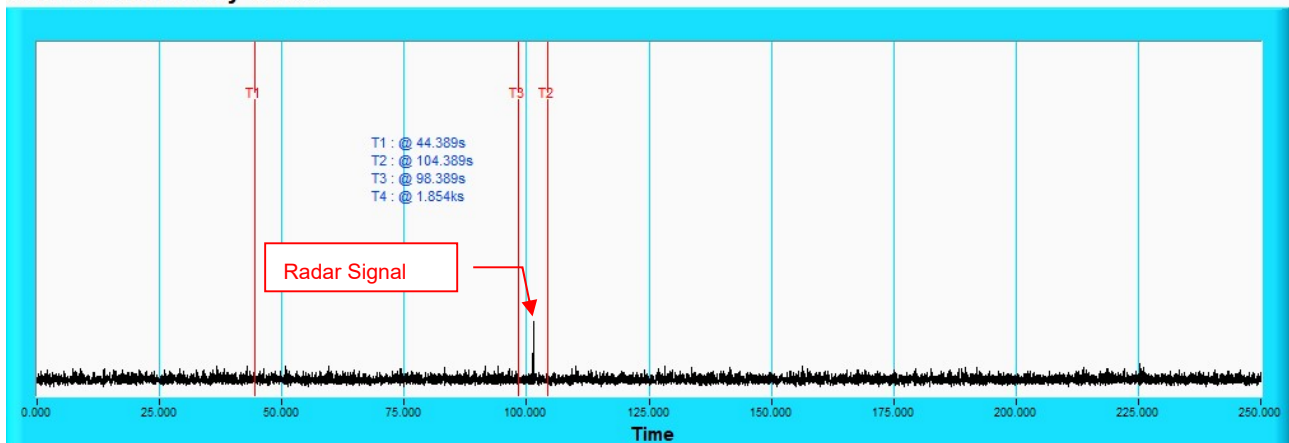
Channel Availability Check



NOTE: T1 denotes the end of power up time period is 44.389th second. T3 denotes 50.389th second and the radar burst was commenced within a 6 second window starting from the end of power-up sequence. T2 denotes the 104.389th second.

Radar Burst at the End of the Channel Availability Check Time

Channel Availability Check

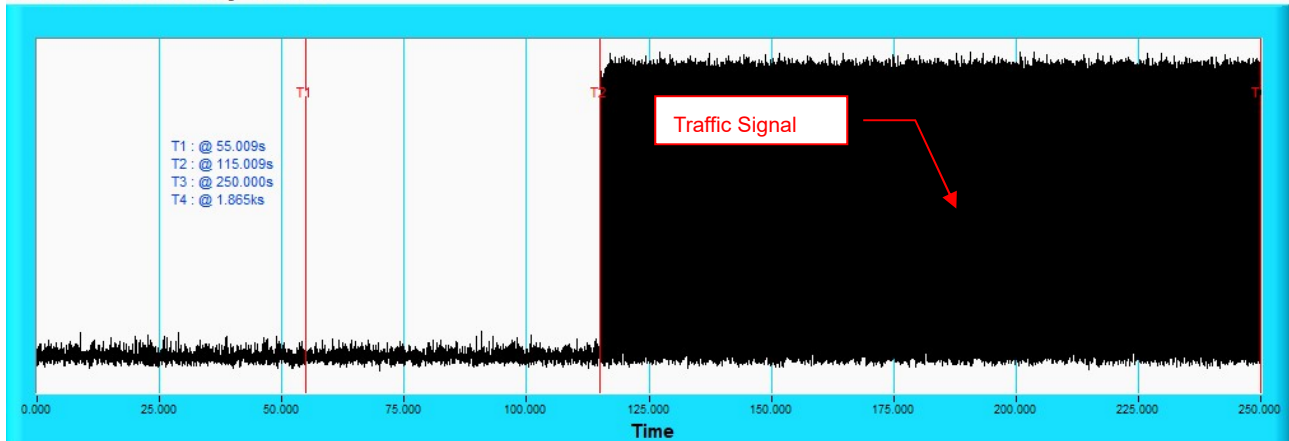


NOTE: T1 denotes the end of power up time period is 44.389th second. T3 denotes 98.389th second and the radar burst was commenced within 54th second to 60th second window starting from the end of power-up sequence. T2 denotes the 104.389th second.

5G_High

Initial Channel Availability Check Time

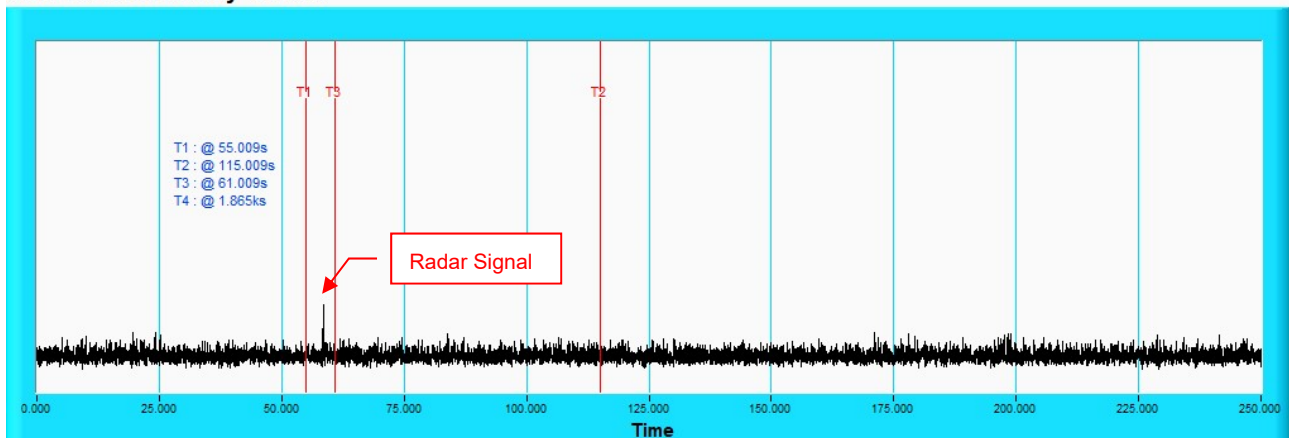
Channel Availability Check



NOTE: T1 denotes the end of power-up time period is 55.009th second. T2 denotes the end of Channel Availability Check time is 115.009th second. Channel Availability Check time is equal to (T2 – T1) 60 seconds.

Radar Burst at the Beginning of the Channel Availability Check Time

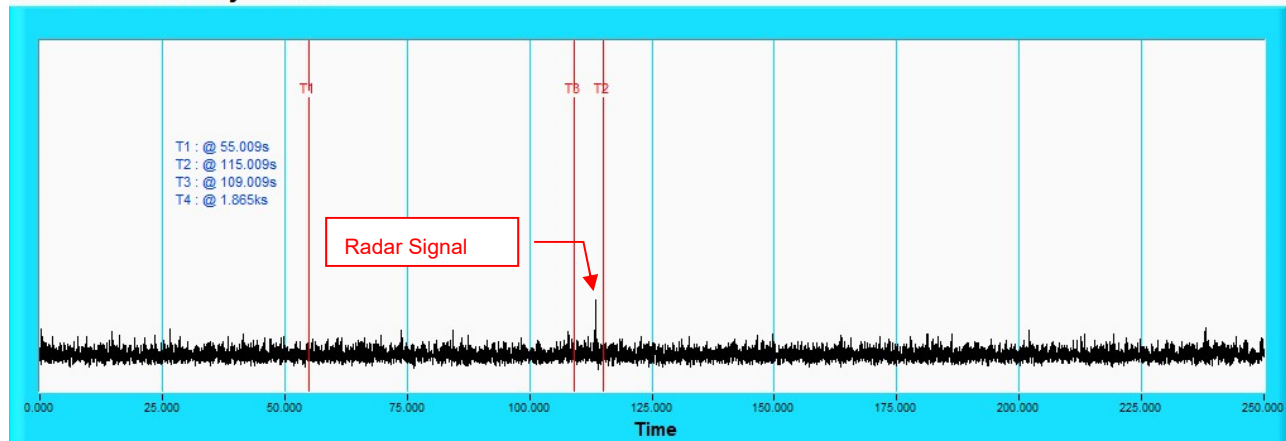
Channel Availability Check



NOTE: T1 denotes the end of power up time period is 55.009th second. T3 denotes 61.009th second and the radar burst was commenced within a 6 second window starting from the end of power-up sequence. T2 denotes the 115.009th second.

Radar Burst at the End of the Channel Availability Check Time

Channel Availability Check



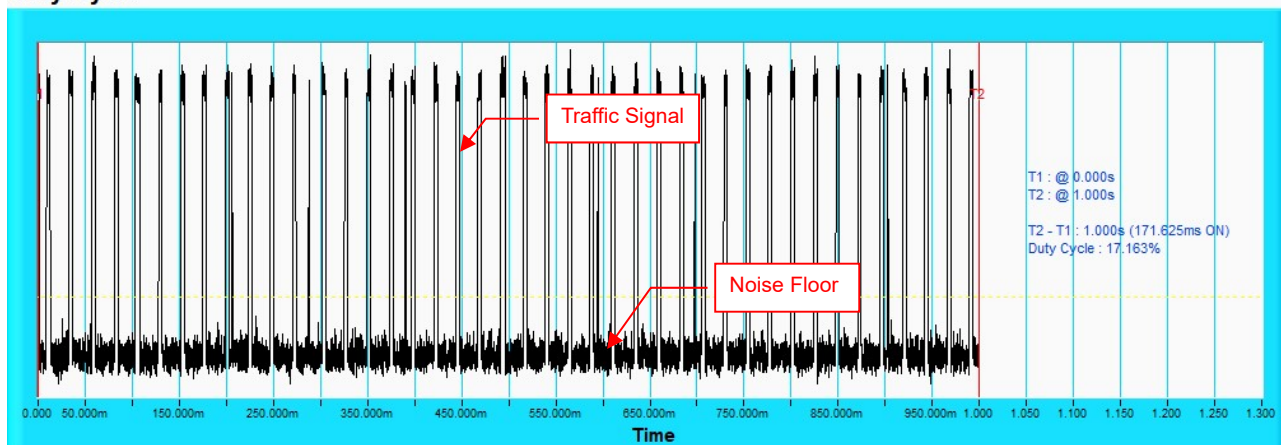
NOTE: T1 denotes the end of power up time period is 55.009th second. T3 denotes 109.009th second and the radar burst was commenced within 54th second to 60th second window starting from the end of power-up sequence. T2 denotes the 115.009th second.

6.2.4 Channel Closing Transmission and Channel Move Time

Wireless Traffic Loading

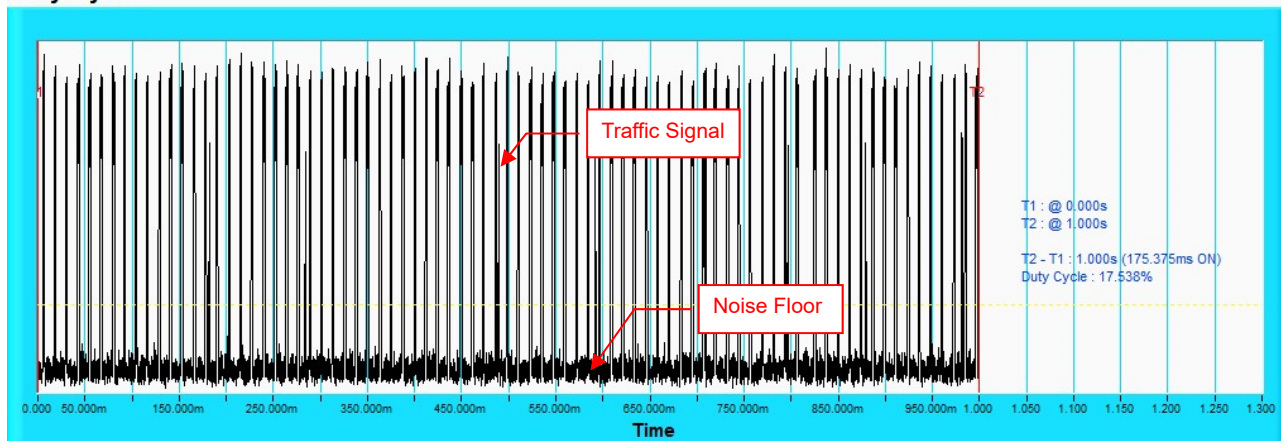
802.11ax (HE20)

Duty Cycle



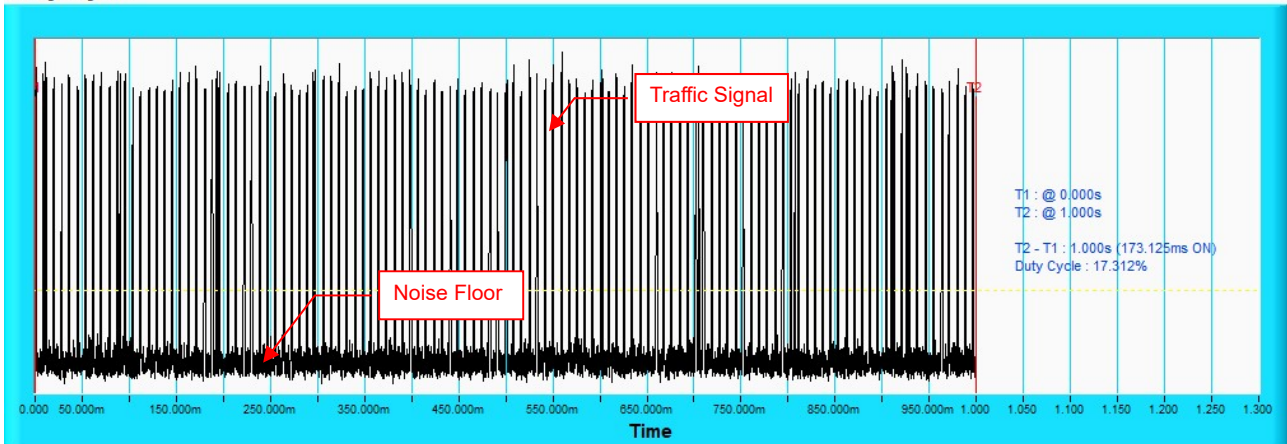
802.11ax (HE40)

Duty Cycle



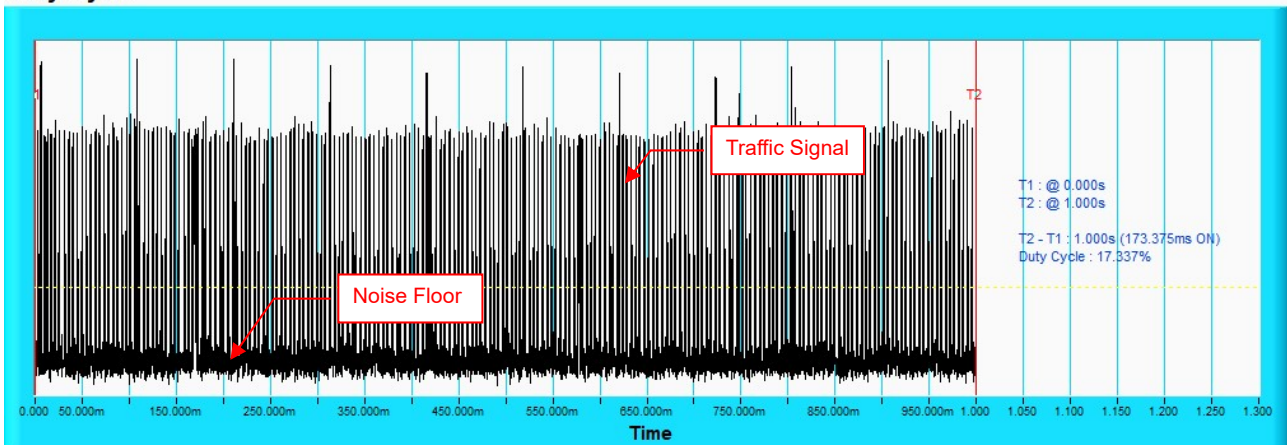
802.11ax (HE80)

Duty Cycle



802.11ax (HE160)

Duty Cycle



5G_Low

802.11ax (HE20)

Table 1: Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Number of Trials(Times)	Percentage of Successful Detection (%)
1	1	Test A 15 unique PRI values randomly selected from the list of 23 PRI values	$\text{Roundup} \left\{ \left\{ \frac{1}{360} \right\} \cdot \left\{ \frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right\} \right\}$	30	96.6
		15 unique PRI values randomly selected within the range of 518~3066 μsec with a minimum of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	30	90
3	6-10	200-500	16-18	30	90
4	11-20	200-500	12-16	30	93.3
Aggregate (Radar Types 1-4)				120	92.4

Table 2: Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Number of Trials(Times)	Percentage of Successful Detection (%)
5	50-100	5-20	1000-2000	1-3	8-20	30	93.3

Table 3: Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Number of Trials(Times)	Percentage of Successful Detection (%)
6	1	333	9	0.333	300	30	96.6

802.11ax (HE40)

Table 1: Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Number of Trials(Times)	Percentage of Successful Detection (%)
1	1	Test A 15 unique PRI values randomly selected from the list of 23 PRI values	$\text{Roundup} \left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	30	96.6
		15 unique PRI values randomly selected within the range of 518~3066 μsec with a minimum of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	30	90
3	6-10	200-500	16-18	30	96.6
4	11-20	200-500	12-16	30	93.3
Aggregate (Radar Types 1-4)				120	94.1

Table 2: Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Number of Trials(Times)	Percentage of Successful Detection (%)
5	50-100	5-20	1000-2000	1-3	8-20	30	96.6

Table 3: Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Number of Trials(Times)	Percentage of Successful Detection (%)
6	1	333	9	0.333	300	30	96.6

802.11ax (HE80)

Table 1: Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Number of Trials(Times)	Percentage of Successful Detection (%)
1	1	Test A 15 unique PRI values randomly selected from the list of 23 PRI values 15 unique PRI values randomly selected within the range of 518~3066 μsec with a minimum of 1 μsec, excluding PRI values selected in Test A	$\text{Roundup} \left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	30	96.6
2	1-5	150-230	23-29	30	96.6
3	6-10	200-500	16-18	30	96.6
4	11-20	200-500	12-16	30	96.6
Aggregate (Radar Types 1-4)				120	96.6

Table 2: Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Number of Trials(Times)	Percentage of Successful Detection (%)
5	50-100	5-20	1000-2000	1-3	8-20	30	96.6

Table 3: Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Number of Trials(Times)	Percentage of Successful Detection (%)
6	1	333	9	0.333	300	30	96.6

802.11ax (HE160)

Table 1: Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Number of Trials(Times)	Percentage of Successful Detection (%)
1	1	Test A 15 unique PRI values randomly selected from the list of 23 PRI values 15 unique PRI values randomly selected within the range of 518~3066 μsec with a minimum of 1 μsec, excluding PRI values selected in Test A	Roundup $\left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	30	96.6
2	1-5	150-230	23-29	30	96.6
3	6-10	200-500	16-18	30	96.6
4	11-20	200-500	12-16	30	96.6
Aggregate (Radar Types 1-4)				120	96.6

Table 2: Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Number of Trials(Times)	Percentage of Successful Detection (%)
5	50-100	5-20	1000-2000	1-3	8-20	30	90

Table 3: Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Number of Trials(Times)	Percentage of Successful Detection (%)
6	1	333	9	0.333	300	30	86.6