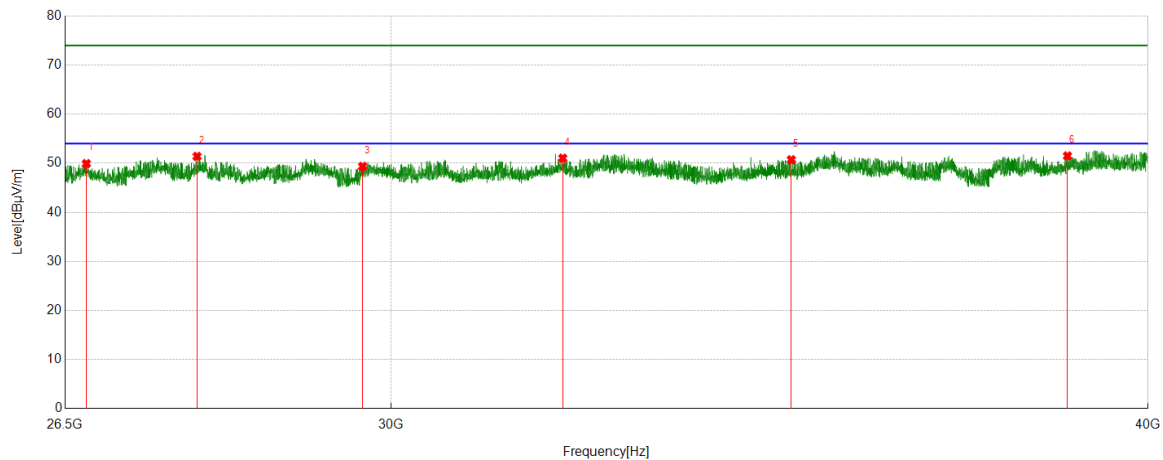


Part IV: 26.5GHz~40GHz

SPURIOUS EMISSIONS 26.5GHz TO 40GHz (WORST-CASE CONFIGURATION)

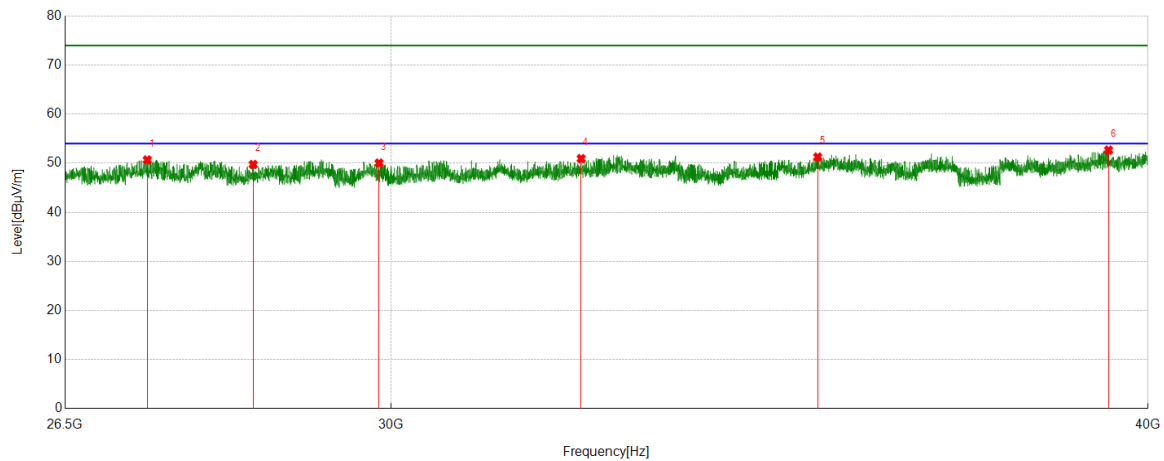
Test Mode	Channel	Polarization	Verdict
11A	5580	Horizontal	PASS



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	26716.0216	57.23	-7.31	49.92	74.00	24.08	peak
2	27863.6364	58.29	-6.90	51.39	74.00	22.61	peak
3	29674.1674	56.34	-6.98	49.36	74.00	24.64	peak
4	32019.3519	58.34	-7.31	51.03	74.00	22.97	peak
5	34926.1926	55.29	-4.59	50.70	74.00	23.30	peak
6	38792.9793	49.57	1.92	51.49	74.00	22.51	peak

Remark: 1. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
3. Measurement = Reading Level + Correct Factor.

Test Mode	Channel	Polarization	Verdict
11A	5580	Vertical	PASS



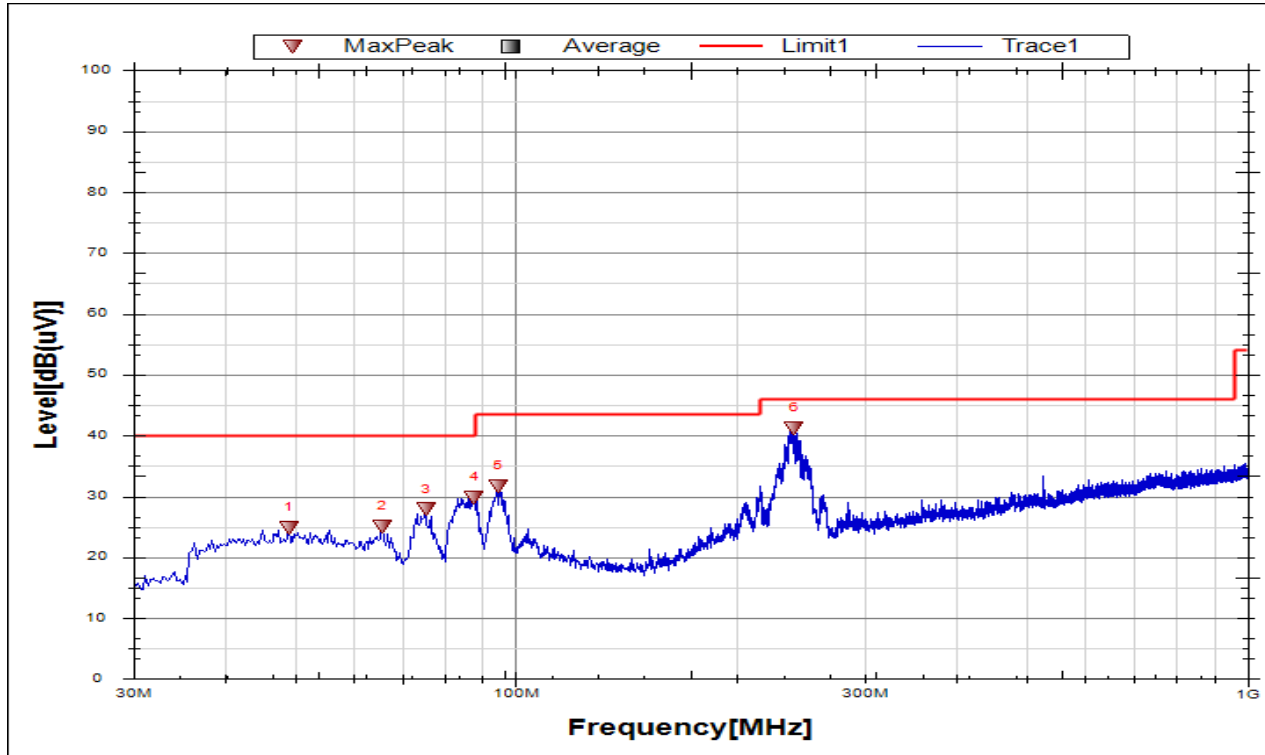
No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	27341.1341	57.88	-7.20	50.68	74.00	23.32	peak
2	28464.4464	57.46	-7.71	49.75	74.00	24.25	peak
3	29860.486	56.85	-6.82	50.03	74.00	23.97	peak
4	32244.8245	57.56	-6.62	50.94	74.00	23.06	peak
5	35278.5779	54.82	-3.55	51.27	74.00	22.73	peak
6	39403.2403	49.52	3.15	52.67	74.00	21.33	peak

Remark: 1. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.
3. Measurement = Reading Level + Correct Factor.

Part V: 30MHz~1GHz

SPURIOUS EMISSIONS 30M TO 1GHz (WORST-CASE CONFIGURATION)

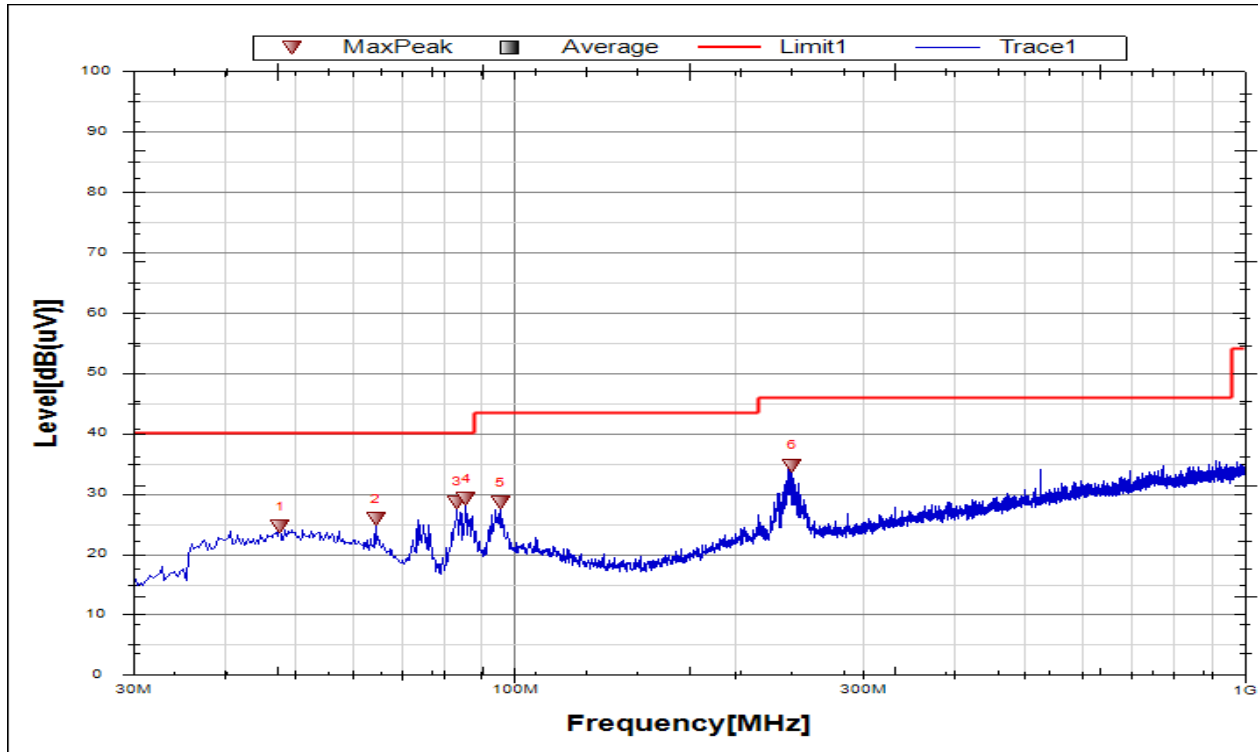
Test Mode	Channel	Polarization	Verdict
11A	5580	Horizontal	PASS



No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	48.9198	3.93	20.92	24.85	40	15.15	peak
2	65.6565	7.24	17.76	25	40	15.00	peak
3	75.3589	12.85	14.99	27.84	40	12.16	peak
4	87.7295	13.59	16.15	29.74	40	10.26	peak
5	94.5212	13.85	17.79	31.64	43.5	11.86	peak
6	240.0578	21.08	20.08	41.16	46	4.84	peak

Remark: 1. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
2. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.
3. Measurement = Reading Level + Correct Factor.

Test Mode	Channel	Polarization	Verdict
11A	5580	Vertical	PASS



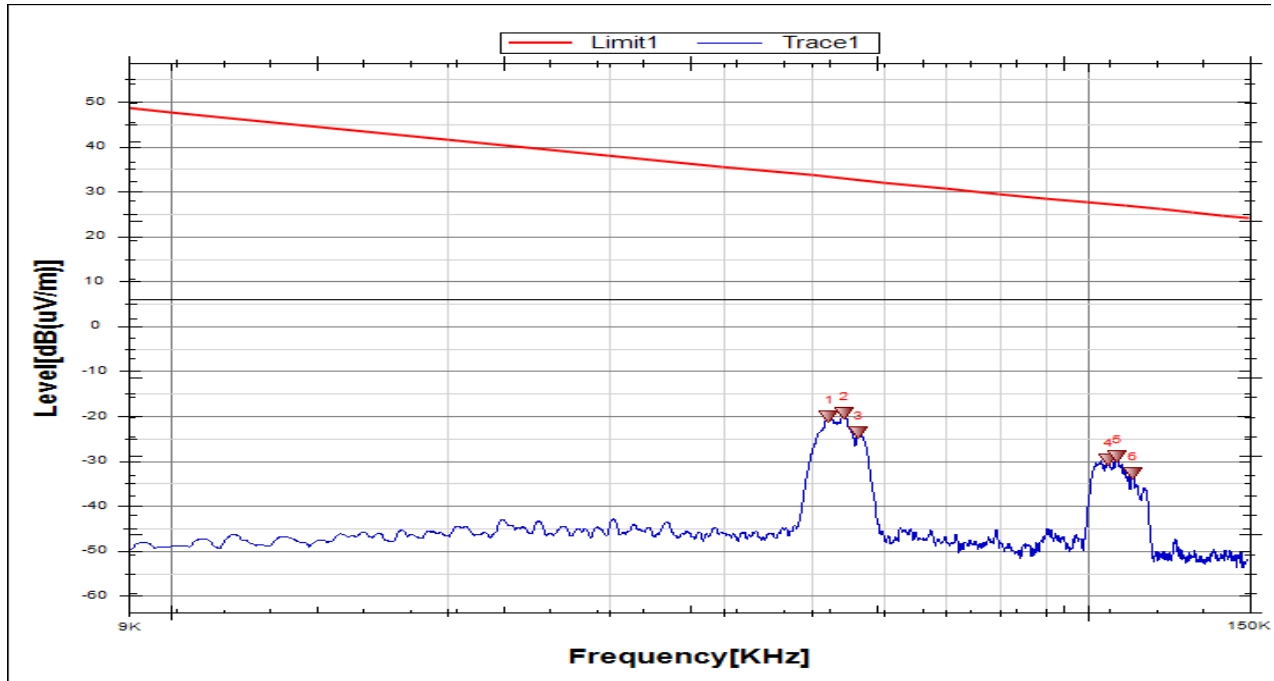
No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	47.707	3.75	20.79	24.54	40	15.46	peak
2	64.4437	7.61	18.16	25.77	40	14.23	peak
3	83.3634	13.76	14.86	28.62	40	11.38	peak
4	85.789	13.54	15.58	29.12	40	10.88	peak
5	95.4915	10.52	17.99	28.51	43.5	14.99	peak
6	239.8153	14.66	20.07	34.73	46	11.27	peak

Remark: 1. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
2. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.
3. Measurement = Reading Level + Correct Factor.

Part VI: 9kHz~30MHz

SPURIOUS EMISSIONS Below 30MHz (WORST CASE CONFIGURATION-FACE ON)

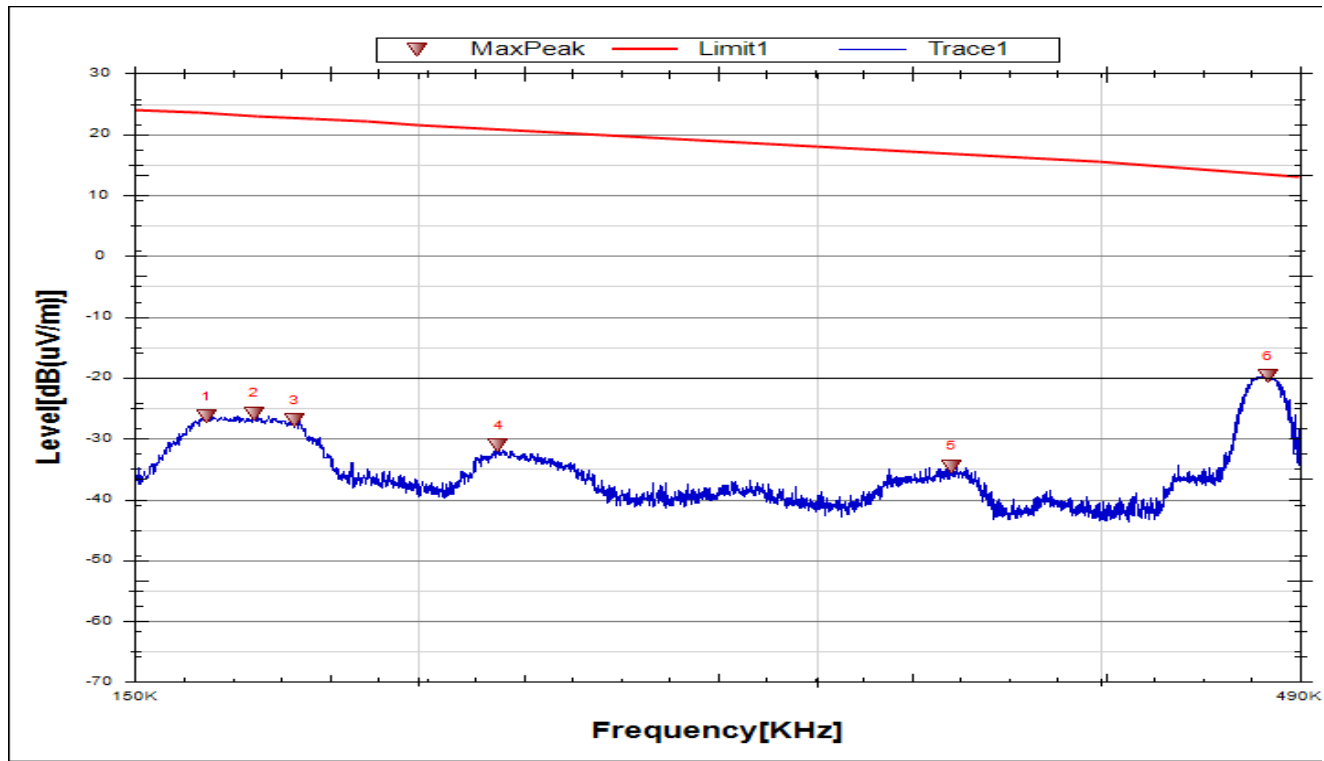
Test Mode	Channel	Frequency Range	Verdict
11A	5580	9kHz~150kHz	PASS



No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	FCC Result (dBuV/m)	FCC Limit (dBuV/m)	Margin (dB)	Remark
1	0.0522	41.51	-61.72	-20.21	33.27	53.48	peak
2	0.0542	42.29	-61.72	-19.43	32.96	52.39	peak
3	0.0562	38.1	-61.73	-23.63	32.64	56.27	peak
4	0.1052	32.14	-61.81	-29.67	27.17	56.84	peak
5	0.1076	32.95	-61.81	-28.86	26.98	55.84	peak
6	0.1119	29.15	-61.82	-32.67	26.64	59.31	peak

Remark: 1. Measurement = Reading Level + Correct Factor.
2. Result 300m= Result 3m-80 dBuV/m
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
4. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report

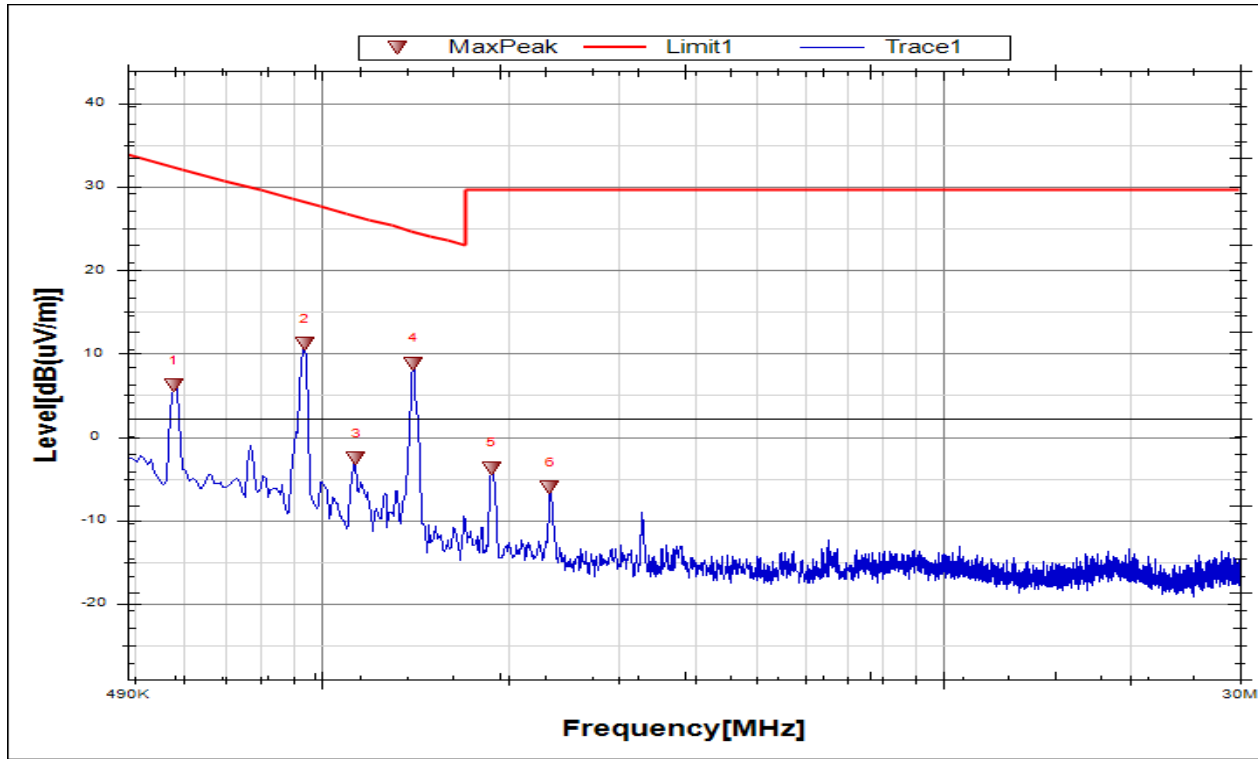
Test Mode	Channel	Frequency Range	Verdict
11A	5580	150kHz~490Hz	PASS



No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	FCC Result (dBuV/m)	FCC Limit (dBuV/m)	Margin (dB)	Remark
1	0.1612	35.45	-61.84	-26.39	23.46	49.85	peak
2	0.1692	35.91	-61.84	-25.93	23.04	48.97	peak
3	0.1763	34.84	-61.85	-27.01	22.68	49.69	peak
4	0.217	30.68	-61.87	-31.19	20.98	52.17	peak
5	0.3439	27.28	-61.9	-34.62	16.96	51.58	peak
6	0.4743	42.07	-61.87	-19.8	13.51	33.31	peak

Remark: 1. Measurement = Reading Level + Correct Factor.
2. Result 300m= Result 3m-80 dBuV/m
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
4. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report

Test Mode	Channel	Frequency Range	Verdict
11A	5580	490kHz~30MHz	PASS



No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	FCC Result (dBuV/m)	FCC Limit (dBuV/m)	Margin (dB)	Remark
1	0.5785	28.01	-21.88	6.13	32.38	26.25	peak
2	0.9401	33.03	-21.85	11.18	28.15	16.97	peak
3	1.1394	19.26	-21.85	-2.59	26.48	29.07	peak
4	1.405	30.65	-21.83	8.82	24.65	15.83	peak
5	1.8773	18.09	-21.82	-3.73	29.54	33.27	peak
6	2.3348	15.74	-21.8	-6.06	29.54	35.60	peak

Remark: 1. Measurement = Reading Level + Correct Factor.
2. Result 30m= Result 3m-40 dBuV/m
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
4. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report

8. FREQUENCY STABILITY

LIMITS

The frequency of the carrier signal shall be maintained within band of operation

TEST SETUP AND PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	PEAK
RBW	10kHz
VBW	$\geq 3 \times \text{RBW}$
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

Allow the trace to stabilize, find the peak value of the power envelope and record the frequency, then calculated the frequency drift.

The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.

User manual temperature is 0°C~50°C.

TEST ENVIRONMENT

Environment Parameter:	Selected Values During Tests	
Relative Humidity:	44%	
Atmospheric Pressure:	102kPa	
Temperature:	TL	0°C
	TN	22.2°C
	TH	509°C
Voltage:	VL	DC 4.5V
	VN	DC 5V
	VH	DC 5.5V

Note:

1)

TL= Lower Extreme Temperature

TN= Normal Temperature

TH= Upper Extreme Temperature

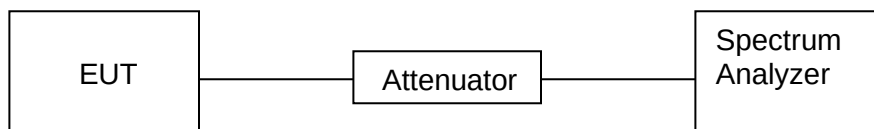
VL= Lower Extreme Test Voltage

VN= Nominal Voltage

VH= Upper Extreme Test Voltage

2) The working temperature and voltage are declared by the customer.

TEST SETUP



TEST RESULTS

Not applicable, the customer will declare the extreme used temperature and voltage in the user manual.

TEST RESULTS (WORST-CASE CONFIGURATION)

Frequency Error vs. Voltage:

Frequency Error vs. Voltage									
802.11a:5180MHz_Antenna2									
Temp.	Volt.	0 Minute		2 Minute		5 Minute		10 Minute	
		Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)
TN	VL	5179.98	-3.861	5180.01	1.931	5179.99	-1.931	5180.02	3.861
TN	VN	5180.07	13.51	5180.07	13.51	5179.99	-1.931	5179.98	-3.861
TN	VH	5179.98	-3.861	5180.03	5.792	5180.07	13.51	5180.03	5.792

Frequency Error vs. Temperature:

Frequency Error vs. Temperature									
802.11a:5180MHz_Antenna2									
Temp.	Volt.	0 Minute		2 Minute		5 Minute		10 Minute	
		Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)
0	VN	5180.07	13.51	5179.99	-1.931	5180.07	13.51	5179.99	-1.931
10	VN	5180.02	3.861	5180.05	9.653	5179.98	-3.861	5180.07	13.51
30	VN	5180.07	13.51	5179.99	-1.931	5179.99	-1.931	5179.99	-1.931
30	VN	5179.98	-3.861	5180.02	3.861	5180.03	5.792	5180.03	5.792
40	VN	5180.07	13.51	5180.02	3.861	5179.99	-1.931	5179.99	-1.931
50	VN	5180.02	3.861	5180.07	13.51	5179.98	-3.861	5180.02	3.861

Remark:

1. All the modulation, antennas and channels had been tested, but only the worst data recorded in the report.

9. DYNAMIC FREQUENCY SELECTION

APPLICABILITY OF DFS REQUIREMENTS

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 Device or Client with Radar Detection	☒ 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
Remark: Frequencies selected for statistical performance check 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.		

LIMITS

(1) DFS Detection Thresholds

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

Maximum Transmit Power	Value (See Remarks 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
Remark 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Remark 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. Remark3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

(2) DFS Response Requirements

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 Remark 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Remarks 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Remark 3.
Remark 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. Remark 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 facilitating 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. Remark 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 RADAR TEST WAVEFORMS

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. 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.

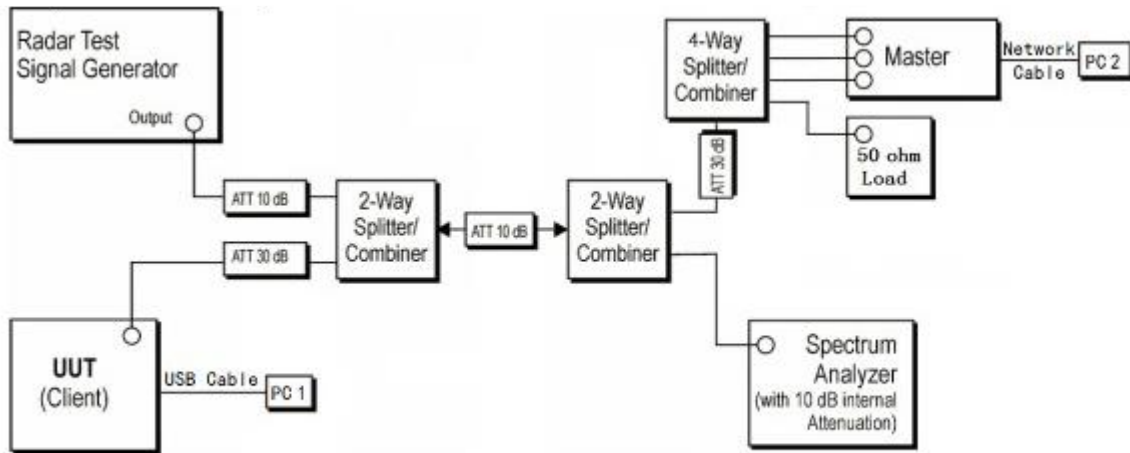
Table 5 Short Pulse Radar Test Waveforms

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	Roundup $\left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	60%	30
		Test B			
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. Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A					

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B. Test aggregate is average of the percentage of successful detections of short pulse radar types 1-4

TEST SETUP

Setup for Client with injection at the Master



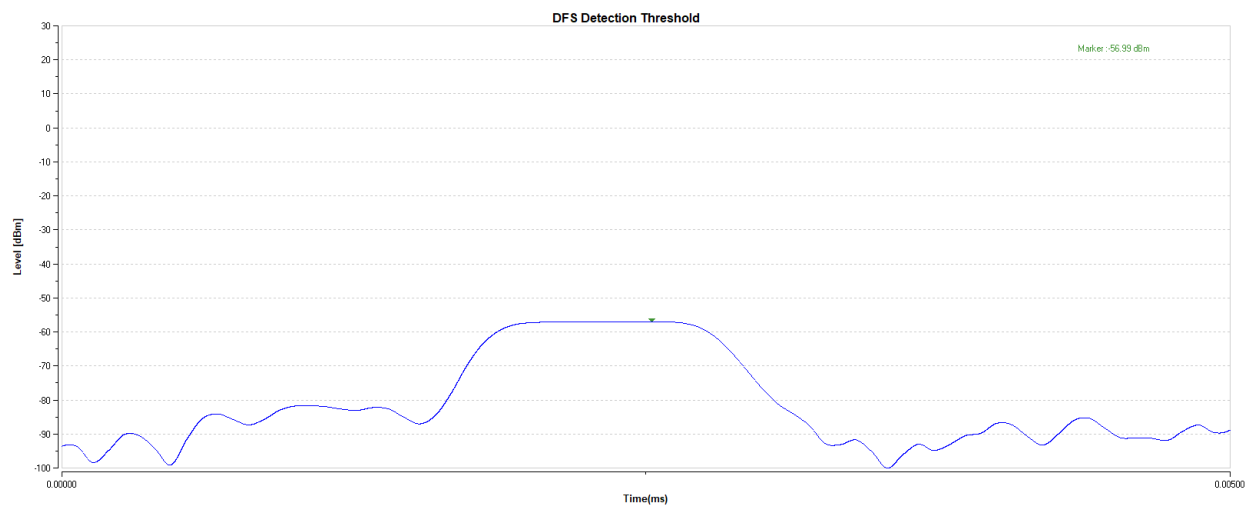
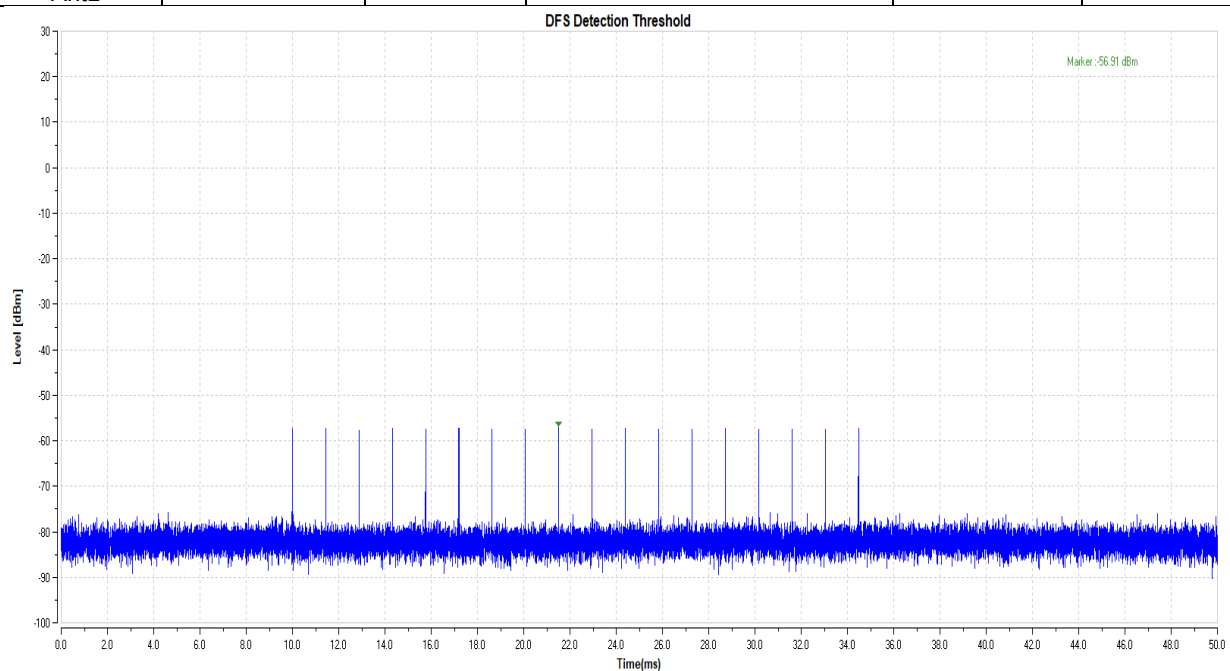
TEST ENVIRONMENT

Temperature	22.2°C	Relative Humidity	50.9%
Atmosphere Pressure	102.2kpa	Test Voltage	DC5V

TEST RESULTS

DFS Detection Threshold levels					
DFS Threshold Level: -55.31					
The Interference Radar Detection Threshold Level is $(-62\text{dBm}) + (5.69 [\text{dBi}]) + \{1 \text{ dB}\} = -55.31\text{dBm}$. That had been taken into account the master output power range and antenna gain.					

TestMode	Frequency[dbm]	Radar Type	Result	Limit[dbm]	Verdict
11AC80-Ant1	5290	Type0	-56.91	-62.00	PASS

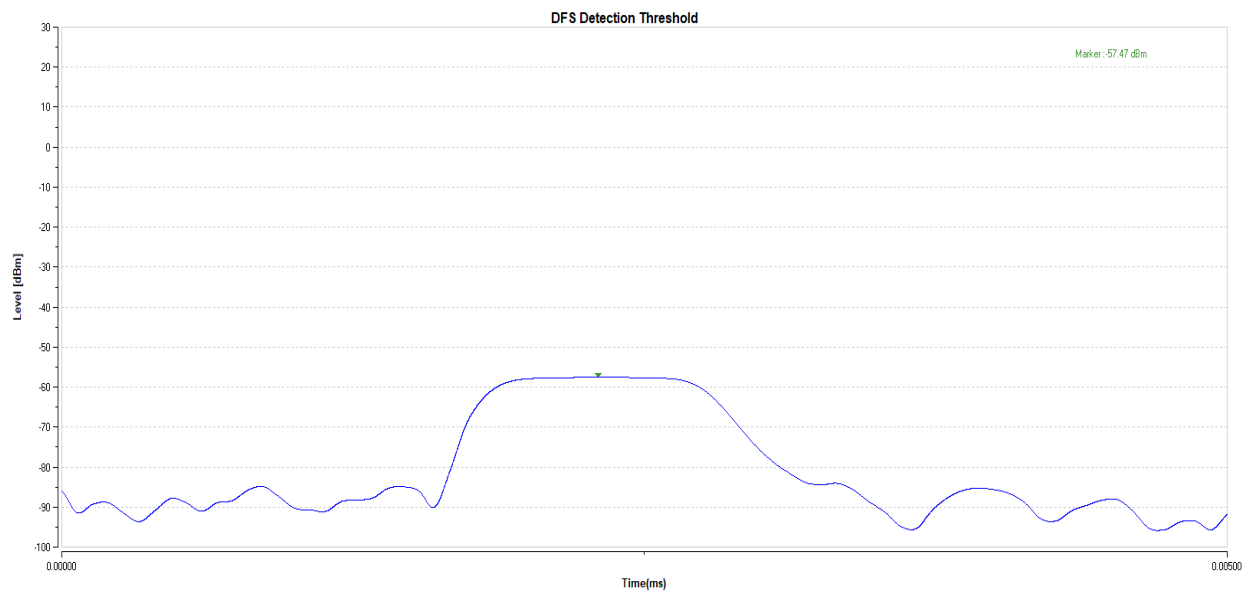
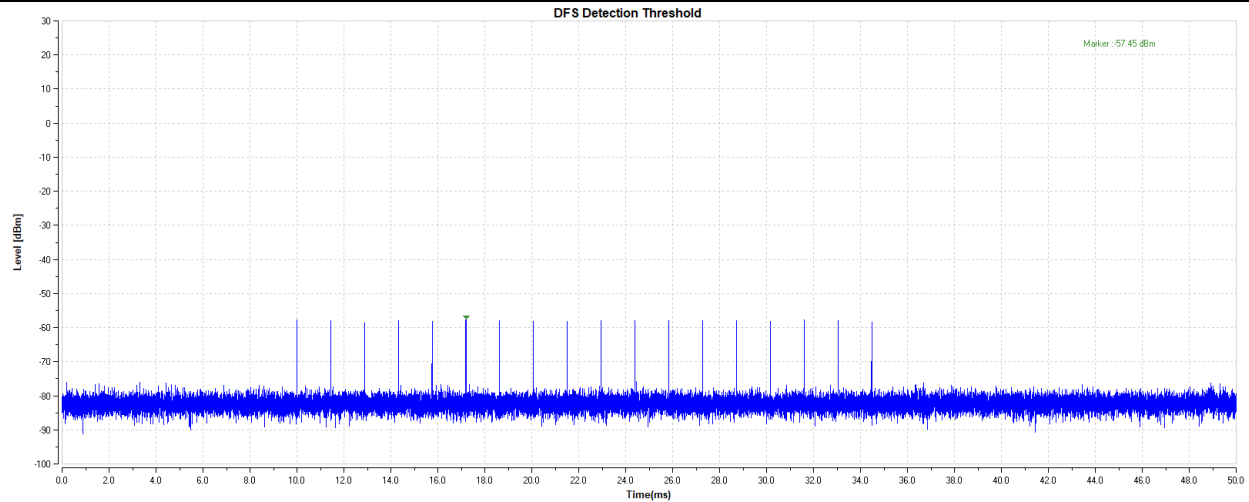


DFS Detection Threshold levels

DFS Threshold Level: -55.56

The Interference **Radar Detection Threshold Level** is $(-62\text{dBm}) + (5.44 [\text{dBi}]) + \{1 \text{ dB}\} = -55.56\text{dBm}$.
That had been taken into account the master output power range and antenna gain.

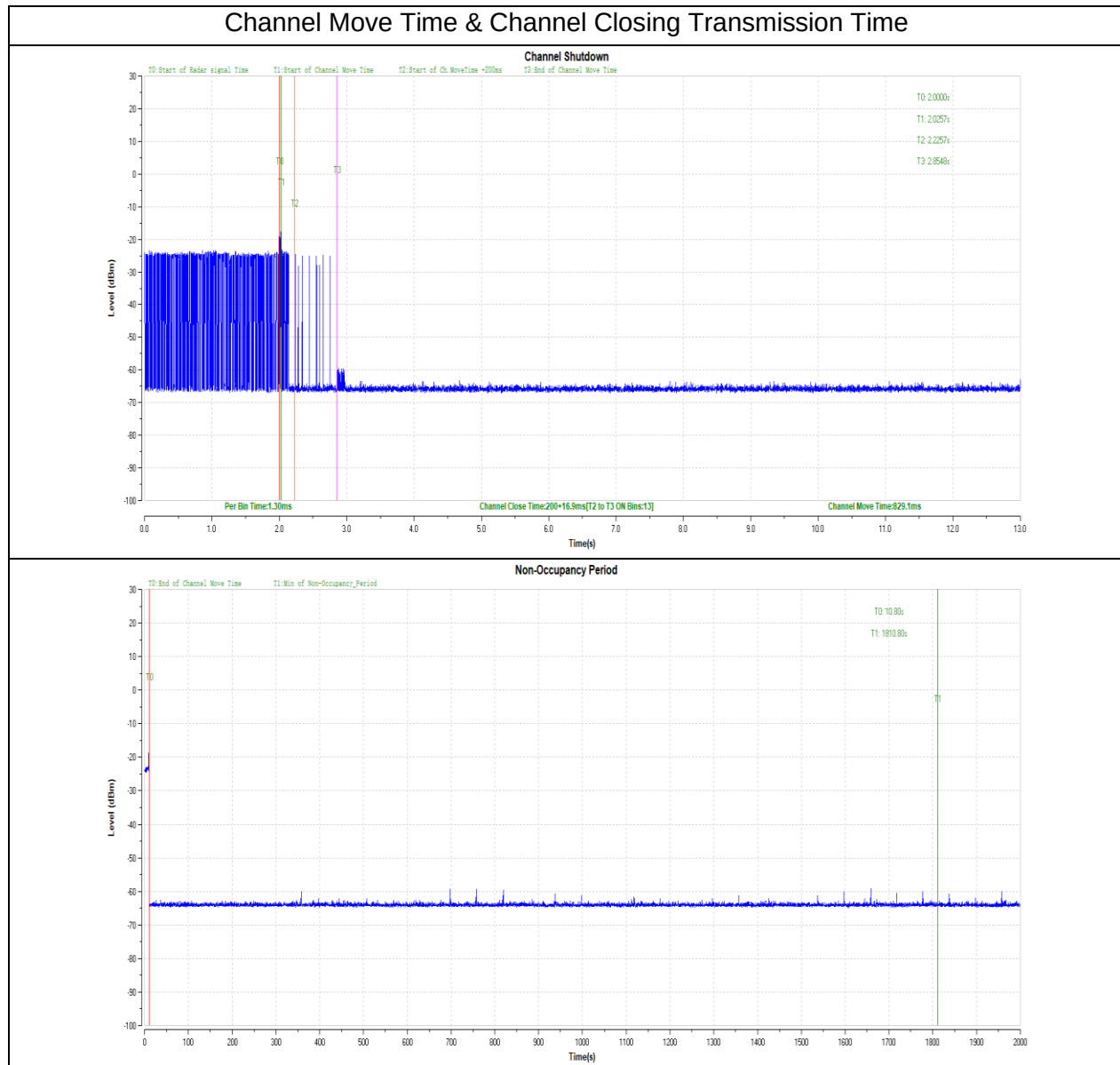
TestMode	Frequency[dbm]	Radar Type	Result	Limit[dbm]	Verdict
11AC80-Ant1	5530	Type0	-54.45	-62.00	PASS



Test Data

BW/Channel	Test Item	Test Result	Limit	Results
11AC80MHz / 5290MHz	Channel Move Time	0.23	<10 s	pass
	Channel Closing Transmission Time	0.63	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period.	pass

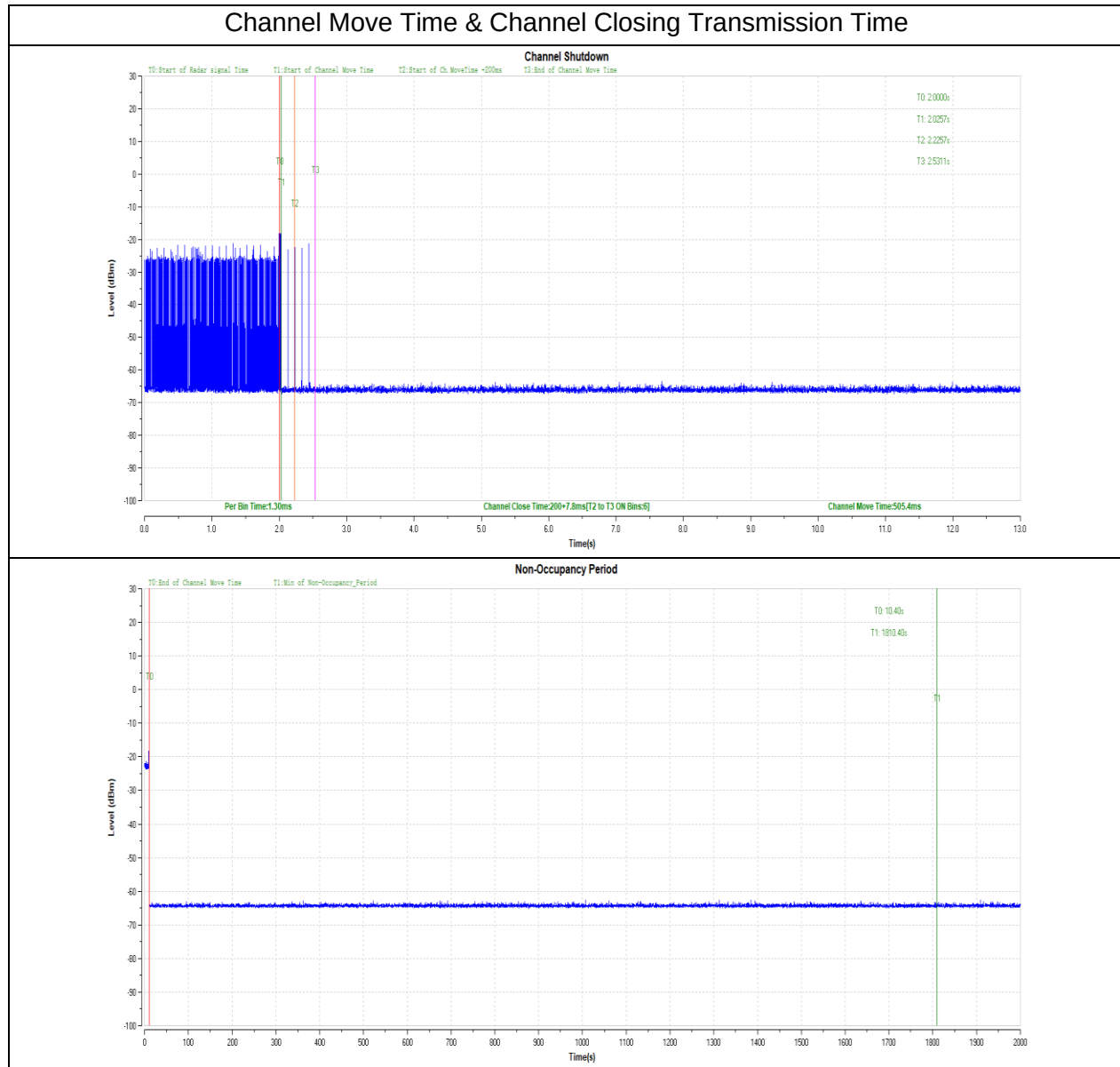
Test plots as follows:



Remark 1: All the antennas, modulation and channels had been tested, but only the worst data recorded in the report.

BW/Channel	Test Item	Test Result	Limit	Results
11AC80MHz / 5530MHz	Channel Move Time	0.26	<10 s	pass
	Channel Closing Transmission Time	0.51	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period.	pass

Test plots as follows:



Remark 1: All the antennas, modulation and channels had been tested, but only the worst data recorded in the report.

10. ANTENNA REQUIREMENTS

APPLICABLE REQUIREMENTS

Please refer 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.407

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ANTENNA GAIN

The antenna gain of EUT is more than 6 dBi, so the power and power density limit shall be reduced amount in dB that the directional gain of the antenna exceeds 6dBi.

END OF REPORT