



REPORT No.: SZ25010010W01

TEST REPORT

APPLICANT : Third Coast Wireless LLC

PRODUCT NAME : Universal Transmitter

MODEL NAME : UT2501

BRAND NAME : Third Coast Wireless

FCC ID : 2BNRX-UT2501

STANDARD(S) : 47 CFR Part 15 Subpart C

RECEIPT DATE : 2025-01-24

TEST DATE : 2025-04-30 to 2025-09-11

ISSUE DATE : 2025-11-18



Edited by:

Zeng Xiaoying
Zeng Xiaoying (Rapporteur)

Approved by:

Shen Junsheng
Shen Junsheng (Supervisor)

NOTE: This document is issued by Shenzhen Morlab Communications Technology Co., Ltd., the test report shall not be reproduced except in full without prior written permission of the company. The test results apply only to the particular sample(s) tested and to the specific tests carried out which is available on request for validation and information confirmed at our website.

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





DIRECTORY

1. Technical Information	3
1.1. Applicant and Manufacturer Information	3
1.2. Equipment Under Test (EUT) Description	3
1.3. The Channel Number and Frequency	4
1.4. Test Standards and Results	5
1.5. Environmental Conditions	6
2. 47 CFR Part 15C Requirements	7
2.1. Antenna Requirement	7
2.2. Hopping Mechanism	8
2.3. Number of Hopping Frequency	9
2.4. Duty Cycle of Test Signal	11
2.5. Maximum Peak Conducted Output Power	12
2.6. Maximum Average Conducted Output Power	15
2.7. 20 dB Bandwidth	16
2.8. Carried Frequency Separation	19
2.9. Time of Occupancy (Dwell time)	21
2.10. Conducted Spurious Emissions	24
2.11. Conducted Emission	29
2.12. Radiated Emission	31
Annex A Test Uncertainty	47
Annex B Testing Laboratory Information	48

Change History		
Version	Date	Reason for change
1.0	2025-11-18	First edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Third Coast Wireless LLC
Applicant Address:	2033 Coldwater Creek Drive Waukesha Wisconsin, 53188 USA
Manufacturer:	KAYI BILISIM ELEKTRONIK ENERJI MAD. VE DAN. LTD. STI.
Manufacturer Address:	Ivedik OSB. 2224. Cad. No 1 Teknopark Ankara C Blok Kat 10 Yenimahalle/Ankara/Turkiye

1.2. Equipment Under Test (EUT) Description

Product Name:	Universal Transmitter
Sample No.:	3#, 5#
Hardware Version:	3.07
Software Version:	1.14
Modulation Technology:	FHSS
Modulation Type:	LoRa (Chirp Spread Spectrum (CSS))
Operating Frequency Range:	913.2MHz–925.8MHz
Antenna Type:	PCB Antenna
Antenna Gain:	1.70dBi

Note 1: The EUT description presented in the report are provided by applicant and/or manufacturer, and the test laboratory is not responsible for the accuracy of the information. For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



1.3. The Channel Number and Frequency

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	913.2	18	916.6	35	920	52	923.4
2	913.4	19	916.8	36	920.2	53	923.6
3	913.6	20	917	37	920.4	54	923.8
4	913.8	21	917.2	38	920.6	55	924
5	914	22	917.4	39	920.8	56	924.2
6	914.2	23	917.6	40	921	57	924.4
7	914.4	24	917.8	41	921.2	58	924.6
8	914.6	25	918	42	921.4	59	924.8
9	914.8	26	918.2	43	921.6	60	925
10	915	27	918.4	44	921.8	61	925.2
11	915.2	28	918.6	45	922	62	925.4
12	915.4	29	918.8	46	922.2	63	925.6
13	915.6	30	919	47	922.4	64	925.8
14	915.8	31	919.2	48	922.6		
15	916	32	919.4	49	922.8		
16	916.2	33	919.6	50	923		
17	916.4	34	919.8	51	923.2		

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



1.4. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result	Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	/
2	15.247(a) 15.247(h)	Hopping Mechanism	N/A	N/A	PASS	/
3	15.247(a)	Number of Hopping Frequency	May. 12, 2025	Su Xiaoxian	PASS	/
4	ANSI C63.10	Duty Cycle	Apr. 29, 2025	Su Xiaoxian	PASS	/
5	15.247(b)	Maximum Peak Conducted Output Power	Sep. 11, 2025	Zhu Peihong	PASS	/
6	15.247(b)	Maximum Average Conducted Output Power	Sep. 11, 2025	Su Xiaoxian	PASS	/
7	15.247(a)	20dB Bandwidth	May. 14, 2025	Su Xiaoxian	PASS	/
8	15.247(a)	Carrier Frequency Separation	May. 12, 2025	Su Xiaoxian	PASS	/
9	15.247(a)	Time of Occupancy (Dwell time)	May. 12, 2025	Su Xiaoxian	PASS	/
10	15.247(d)	Conducted Spurious Emission	May. 13, 2025	Su Xiaoxian	PASS	/
11	15.207	Conducted Emission	N/A	N/A	N/A ^{Note1}	/
12	15.209,	Radiated	Aug. 29, 2025	Gao Jianrou	PASS	/



	15.247(d)	Emission				
Note 1: Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Note 2: The tests were performed according to the method of measurements prescribed in ANSI C63.10-2020, KDB 558074 D01 v05r02 and DA 00-075. Note 3: Any additions, deviation, or exclusions from the method shall be noted in the "Remark".						

1.5. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

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



2. 47 CFR Part 15C Requirements

2.1. Antenna Requirement

2.1.1. Applicable Standard

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.

2.1.2. Test Result: Compliant

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



2.2. Hopping Mechanism

2.2.1. Requirement

According to FCC §15.247(a)(1), a frequency hopping spread spectrum system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

According to FCC §15.247(h), the incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hop sets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

2.2.2. Result: Compliant

The hopping mechanism of the EUT is based on the protocol that "**LoRaWAN**".

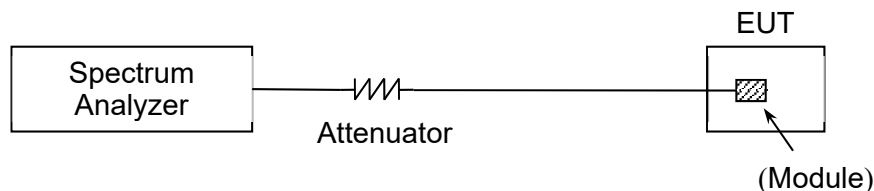
2.3. Number of Hopping Frequency

2.3.1. Requirement

According to FCC section 15.247(a)(1)(i), frequency hopping systems operating in the 902MHz to 928MHz bands shall use at least 50 hopping frequencies if the 20dB bandwidth of the hopping channel is less than 250KHz; or at least 25 hopping frequencies if the 20dB bandwidth of the hopping channel is 250KHz or greater.

2.3.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer (SA) with Attenuators the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the EUT is activated by the PC via Lan port.

2.3.3. Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = the frequency band of operation

RBW $\geq$ 1% of the span

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize

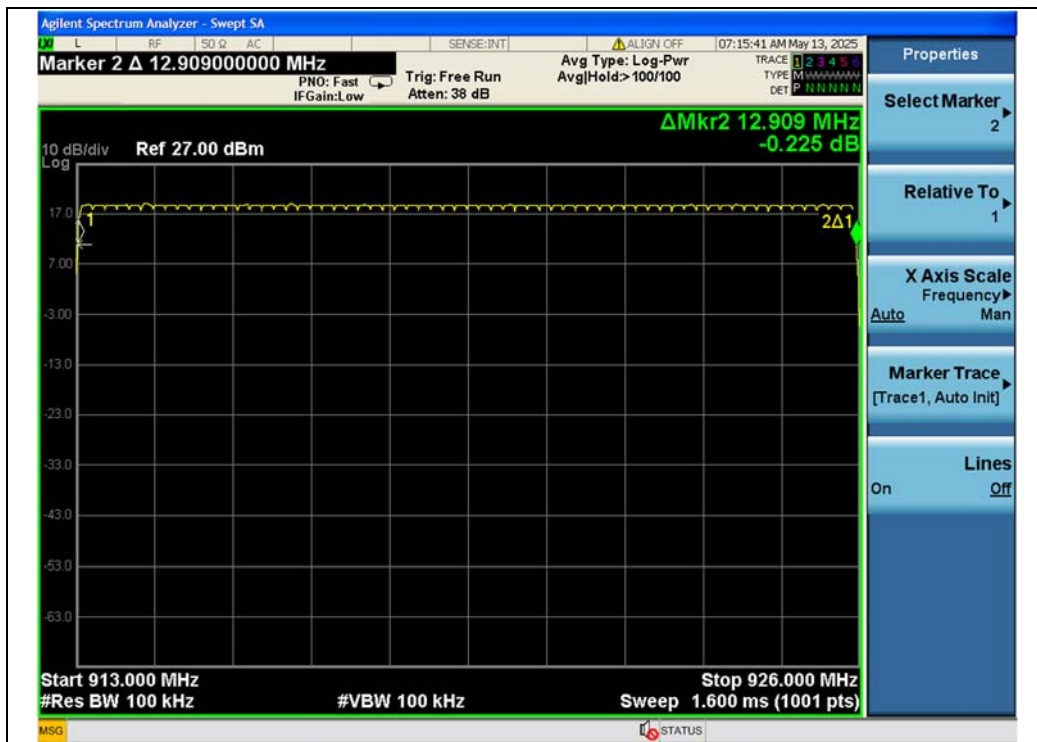


2.3.4. Test Result

A.Test Verdict:

Frequency Block (MHz)	Measured Channel Numbers	Min. Limit	Verdict
902-928	64	50	PASS

B.Test Plots:



2.4. Duty Cycle of Test Signal

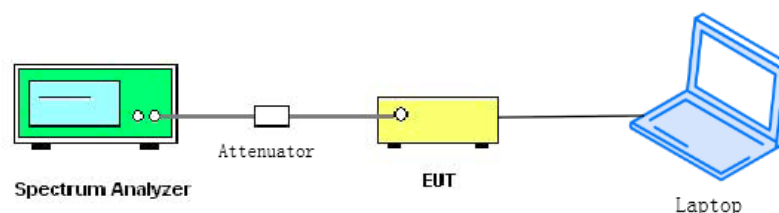
2.4.1. Requirement

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 nonconstant.

2.4.2. Test Description

Test Setup:



ANSI C63.10 2013 Clause 11.6 was used in order to prove compliance.

2.4.3. Test Result

Duty Cycle (%) (D)	Duty Factor ($10 \cdot \lg[1/D]$)
100	0

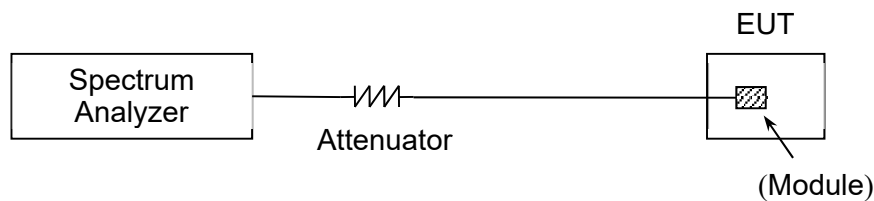
2.5. Maximum Peak Conducted Output Power

2.5.1. Requirement

According to FCC section 15.247(b)(2), for frequency hopping systems that operates in the 902MHz to 928MHz band employing at least 50 hopping channels, the maximum peak output power of the intentional radiator shall not exceed 1Watt, and 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels.

2.5.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer (SA) with Attenuators the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the EUT is activated by the PC via Lan port.



2.5.3. Test Result

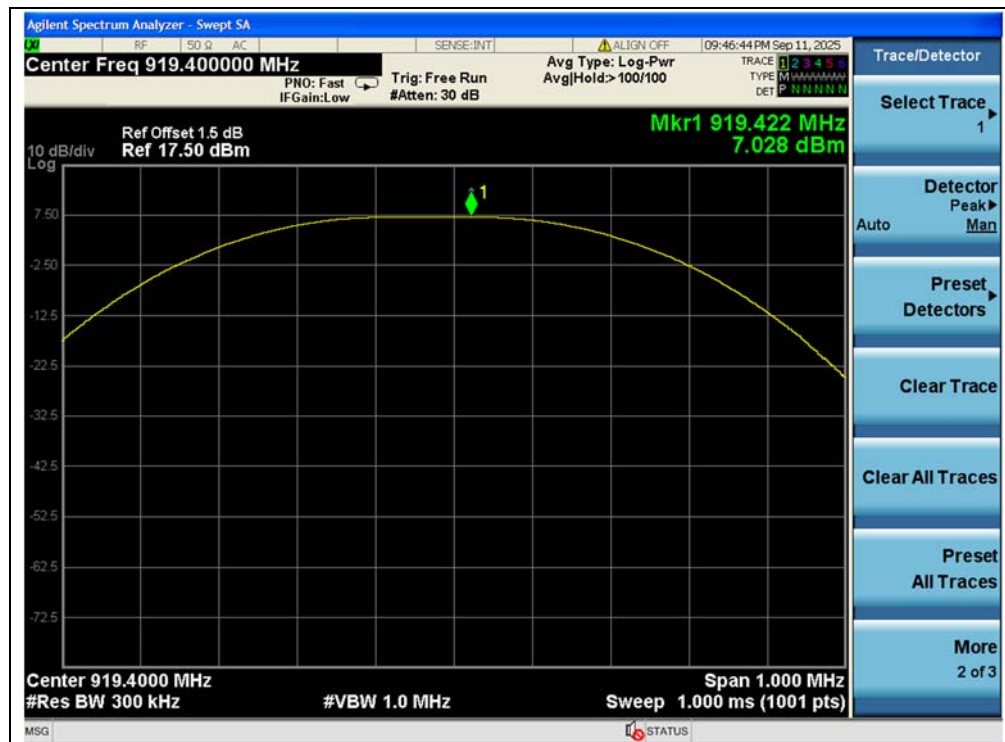
A.Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	913.2	7.002	0.0050	30	1	PASS
32	919.4	7.028	0.0050			PASS
64	925.8	7.321	0.0054			PASS

B.Test Plot:



(Channel 1)



(Channel 32)



(Channel 64)

2.6. Maximum Average Conducted Output Power

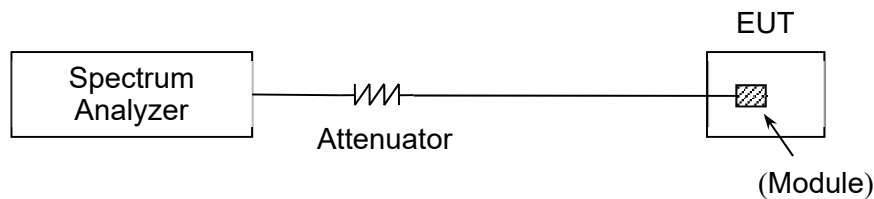
2.6.1. Requirement

According to FCC section 15.247(b)(2), for frequency hopping systems that operates in the 902MHz to 928MHz band employing at least 50 hopping channels, the maximum peak output power of the intentional radiator shall not exceed 1Watt, and 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels.

2.6.2. Test Description

The measured output power was calculated by the reading of the USB Wideband Power Sensor and calibration.

Test Setup:



The EUT is coupled to the Spectrum Analyzer (SA) with Attenuators the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the EUT is activated by the PC via Lan port.

2.6.3. Test Result

Channel	Frequency (MHz)	Measured dBm	Average Power			Limit		Verdict
			Duty Factor	Duty Factor Calculated		dBm	W	
1	913.2	6.74	0.00	6.74	0.0047	30	1	PASS
32	919.4	6.90		6.90	0.0049			PASS
64	925.8	7.12		7.12	0.0052			PASS

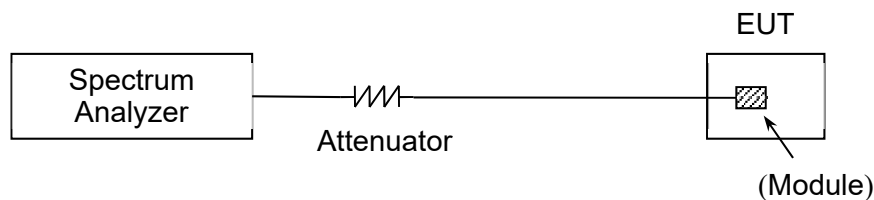
2.7. 20 dB Bandwidth

2.7.1. Definition

According to FCC §15.247(a)(1), the 20dB bandwidth is known as the 99% emission bandwidth, or 20 dB bandwidth ($10 \cdot \log 1\% = 20\text{dB}$) taking the total RF output power.

2.7.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer (SA) with Attenuators the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the EUT is activated by the PC via Lan port.

2.7.3. Test Procedure

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW $\geq$ 1% of the 20 dB bandwidth

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

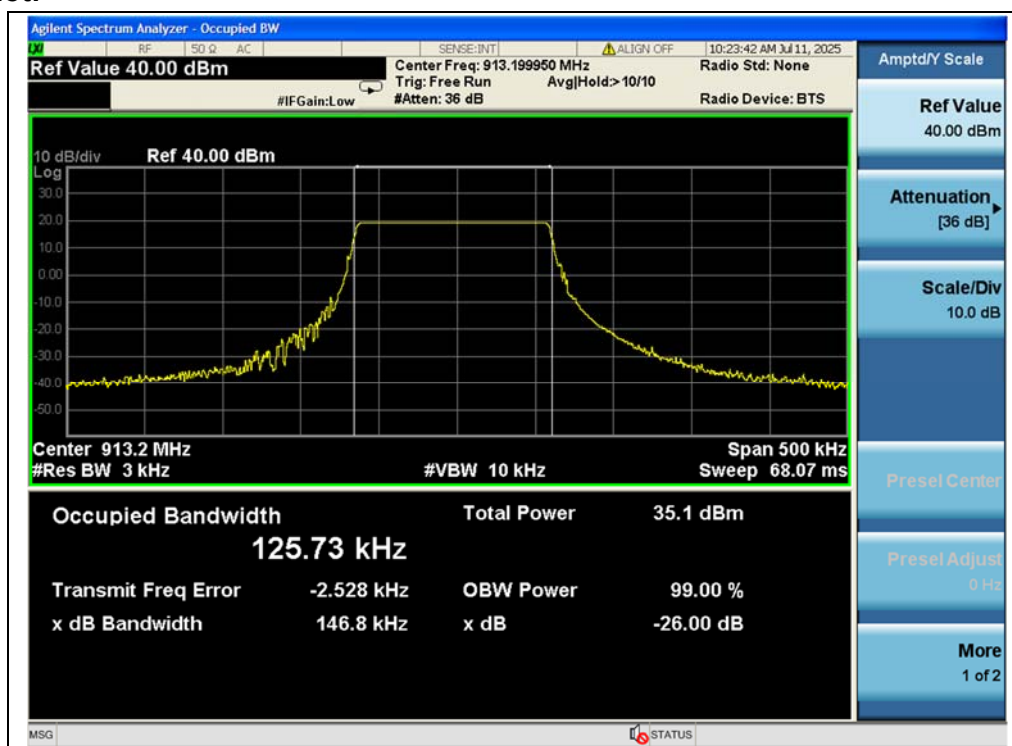


2.7.4. Test Result

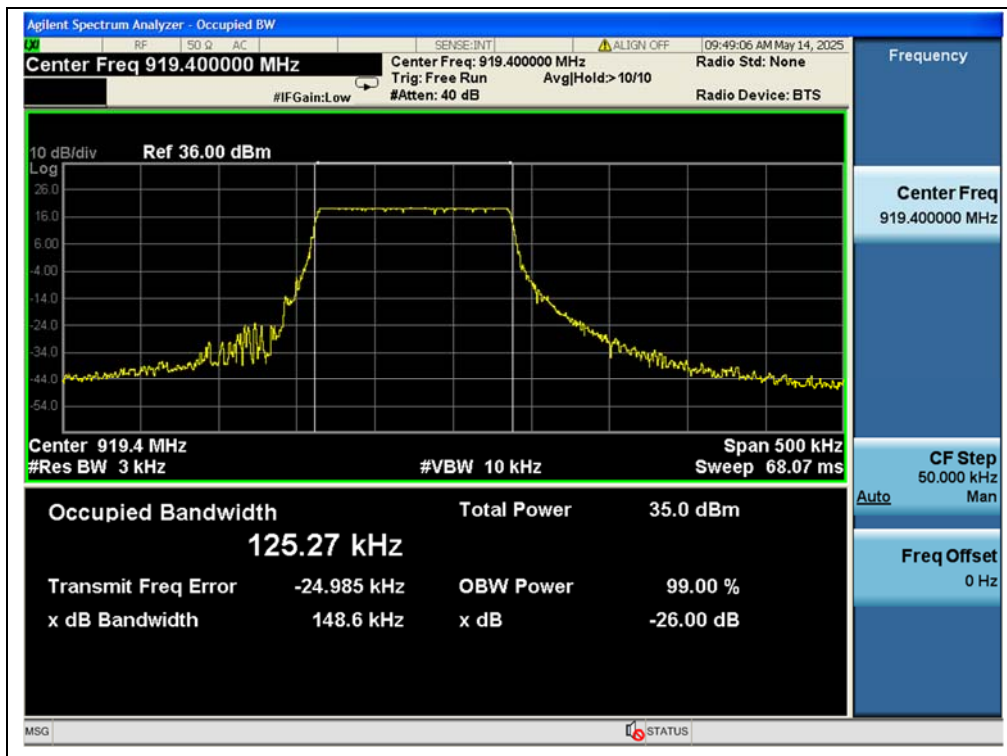
A. Test Verdict:

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	Result
1	913.2	146.8	PASS
32	919.4	148.6	PASS
64	925.8	149.5	PASS

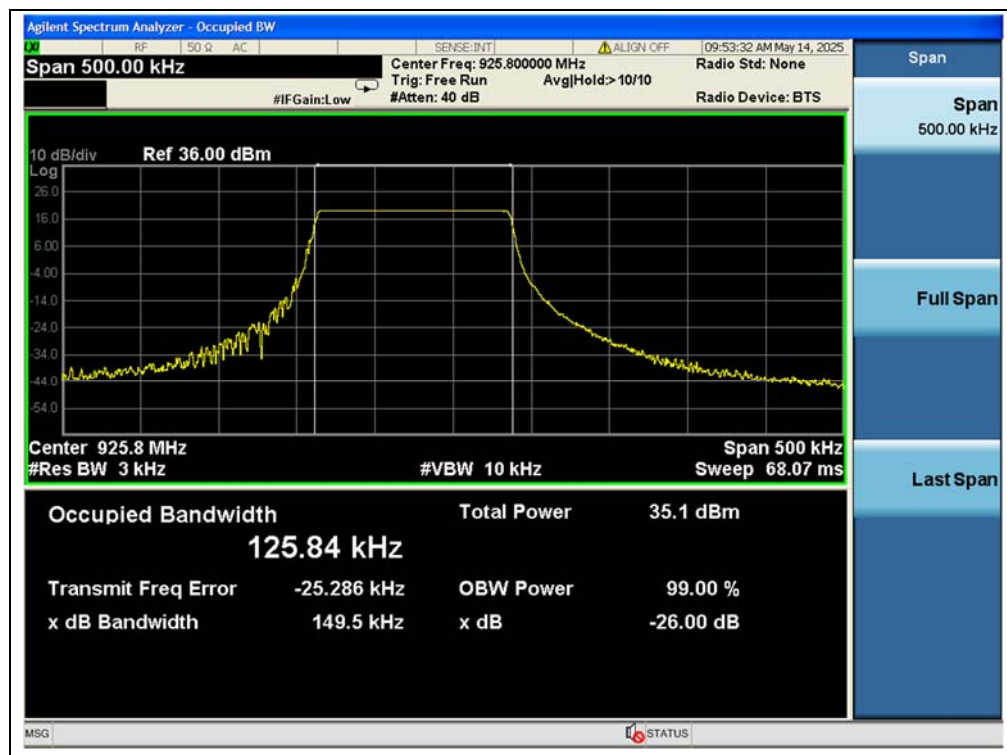
B. Test Plot:



(Channel 1)



(Channel 32)



(Channel 64)

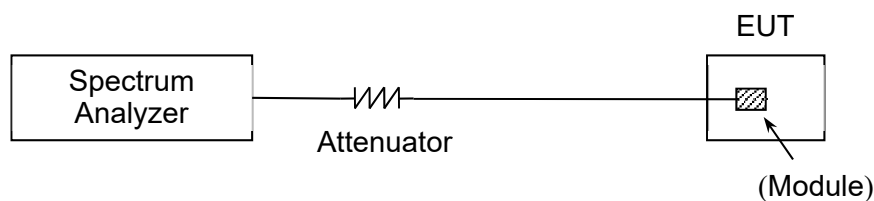
2.8. Carried Frequency Separation

2.8.1. Definition

According to FCC §15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or 20dB bandwidth of the hopping channel, whichever is greater.

2.8.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer (SA) with Attenuators the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the EUT is activated by the PC via Lan port.

2.8.3. Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) Bandwidth (RBW) $\geq 1\%$ of the span

Video (or Average) Bandwidth (VBW) $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

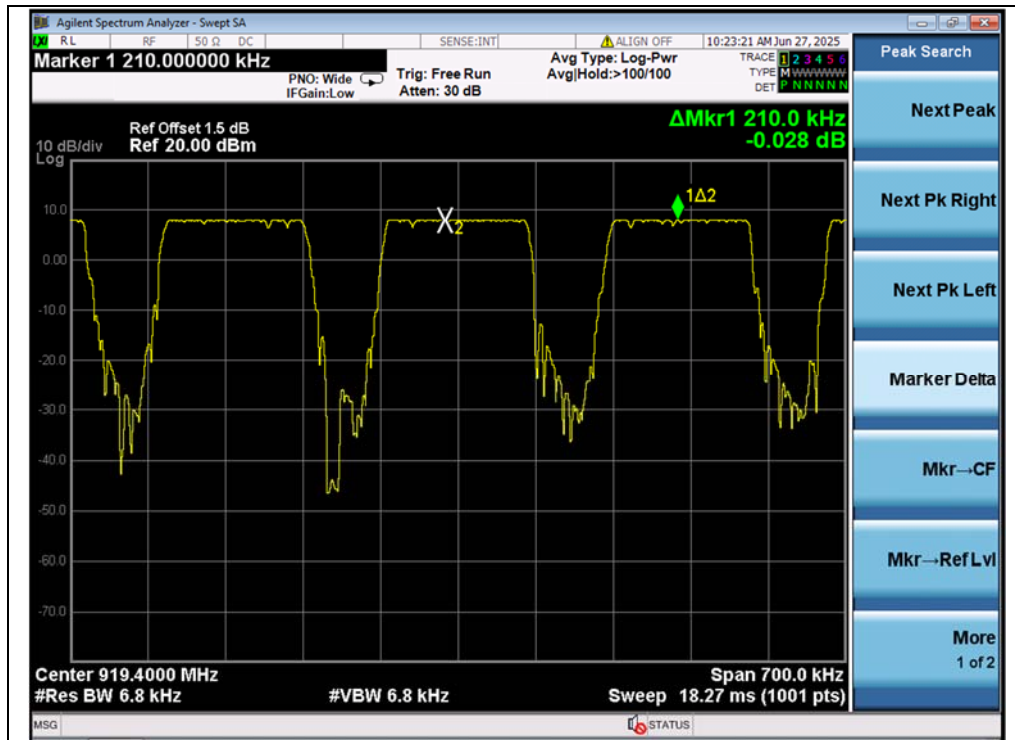


2.8.4. Test Result

A.Test Verdict:

Test Mode	Measured Channel Numbers	Carried Frequency Separation (kHz)	20dB bandwidth (kHz)	Min. Limit	Verdict
LoRa	31 and 32	210	148.6	20dB bandwidth	PASS

B.Test Plot:



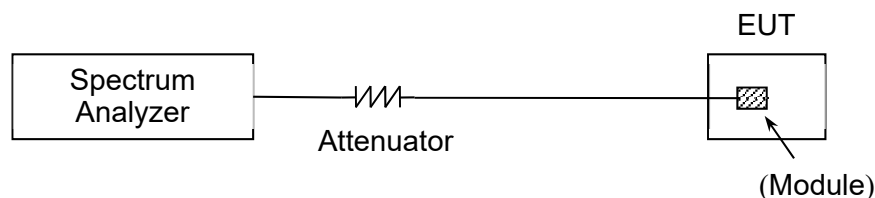
2.9. Time of Occupancy (Dwell time)

2.9.1. Requirement

According to FCC §15.247(a) (1) (iii), frequency hopping systems in the 2400 - 2483.5MHz band shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

2.9.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer (SA) with Attenuators the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the EUT is activated by the PC via Lan port.

2.9.3. Test Procedure

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in 10 second scan, to enable resolution of each occurrence. The average time of occupancy in the specified 20 second period is equal to (# of pulses in 20s) * pulse width.

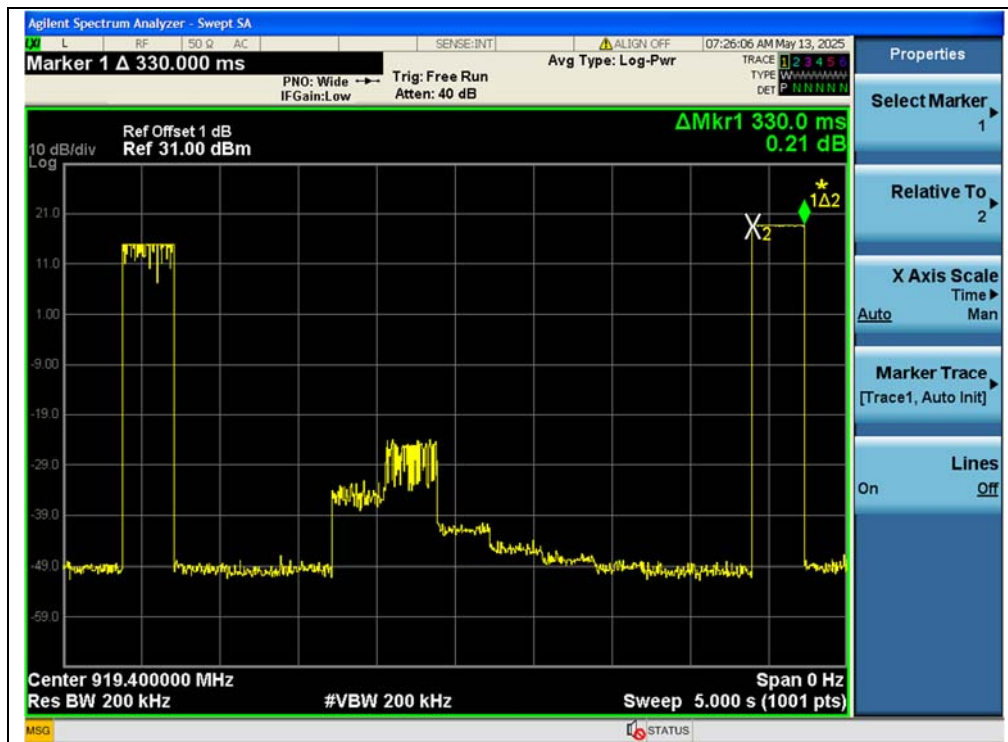


2.9.4. Test Result

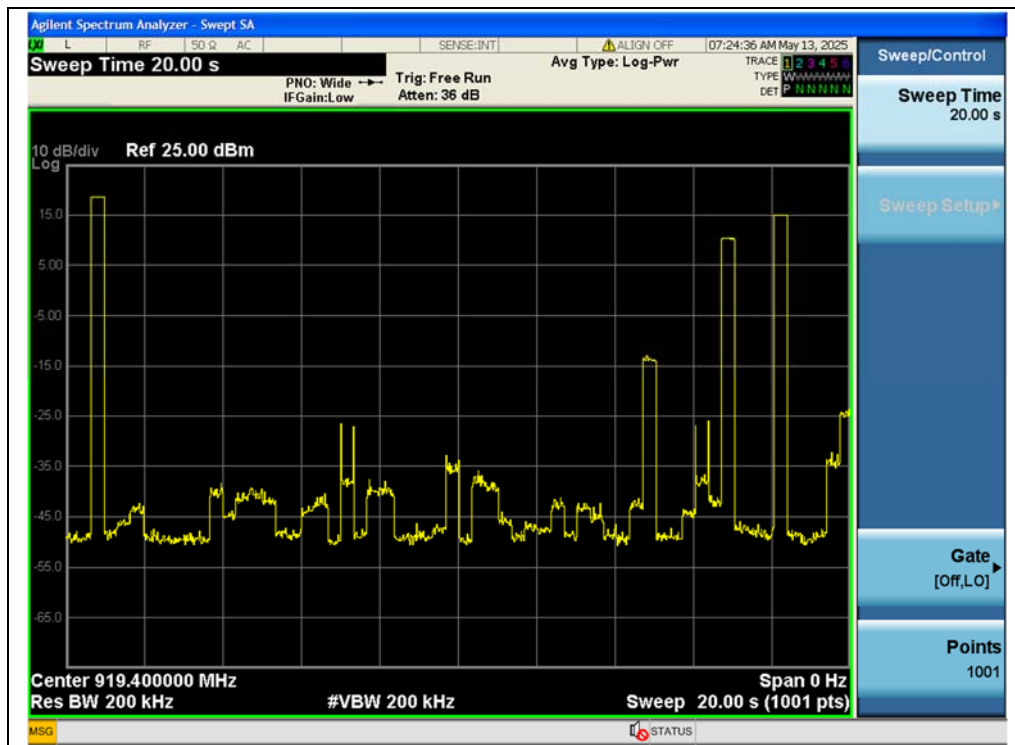
A.Test Verdict:

Frequency (MHz)	Pulse Width (sec)	Number of pulse in 20 seconds	Average Time of Occupancy (sec)	Limit (sec)	Verdict
919.4	0.33	1	0.33	0.4	PASS

B.Test Plot:



(Dwell time_ Pulse Width)



(Dwell time_Number of pulse)

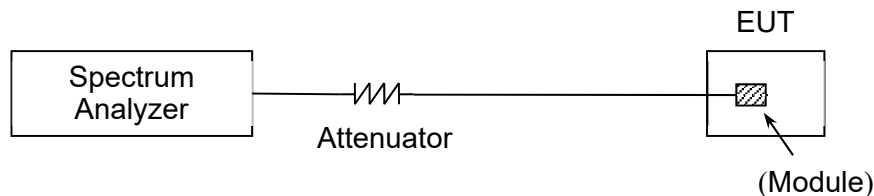
2.10. Conducted Spurious Emissions

2.10.1. Requirement

According to FCC §15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

2.10.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer (SA) with Attenuators the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. During the measurement, the EUT is activated by the PC via Lan port.

2.10.3. Test Procedure

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

RBW = 100 kHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize

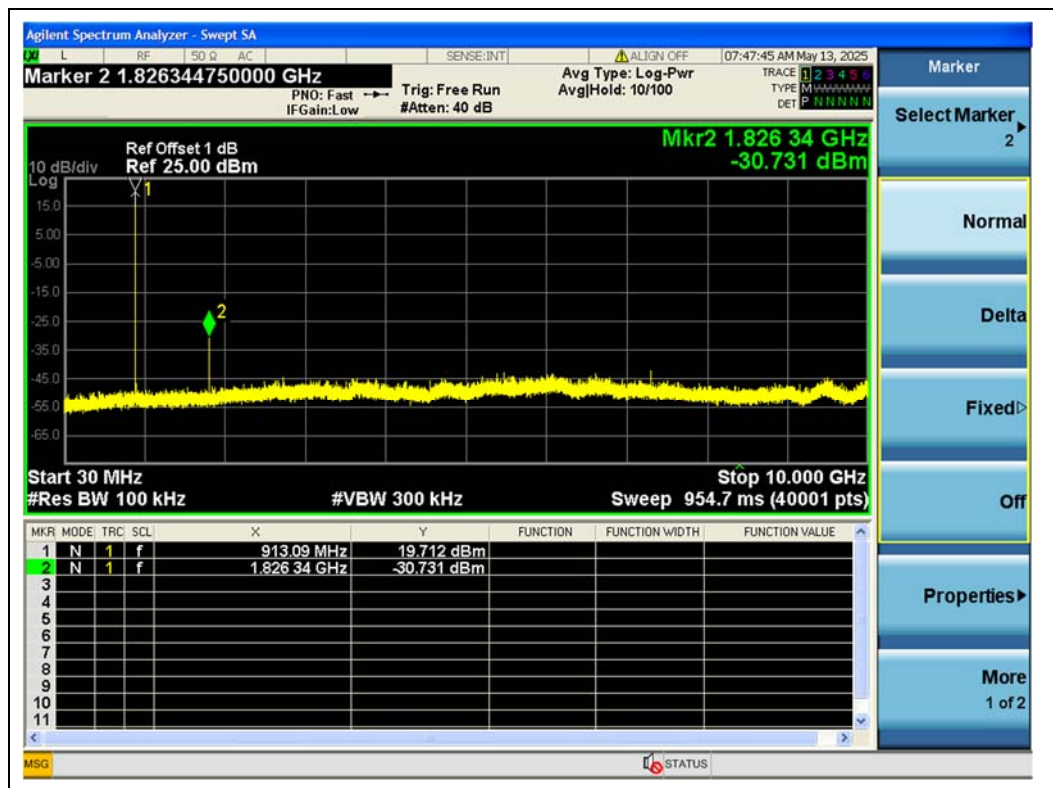


2.10.4. Test Result

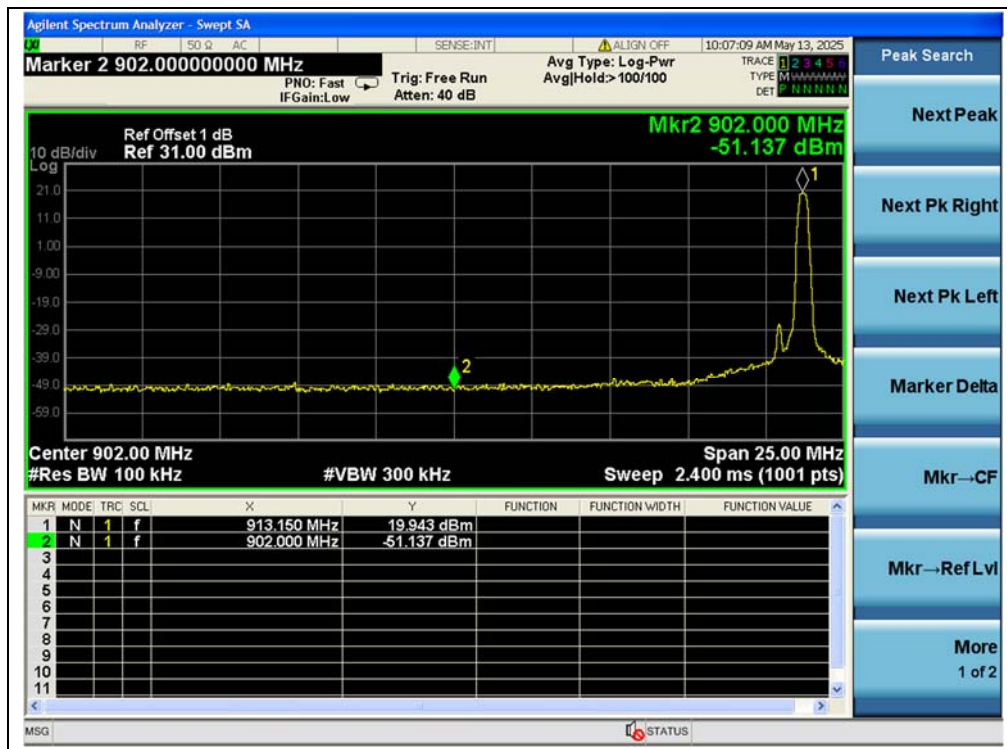
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated - 20dBc Limit	
1	913.2	-30.73	19.71	-0.29	PASS
32	919.4	-31.73	19.63	-0.37	PASS
64	925.8	-32.45	19.75	-0.25	PASS

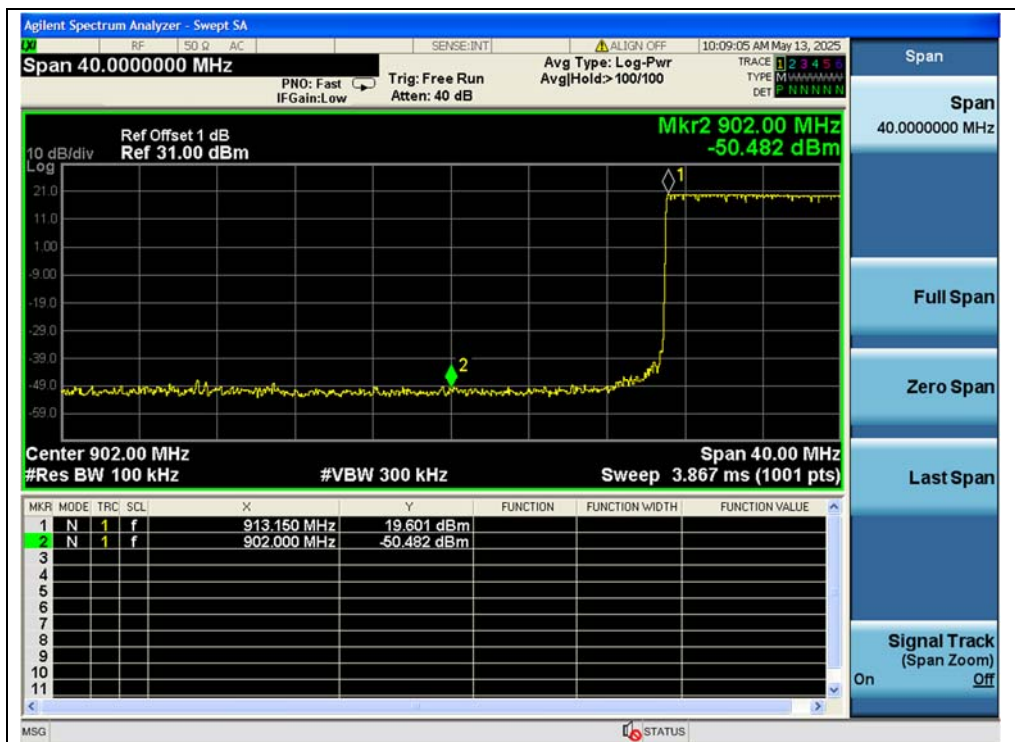
B.Test Plot:



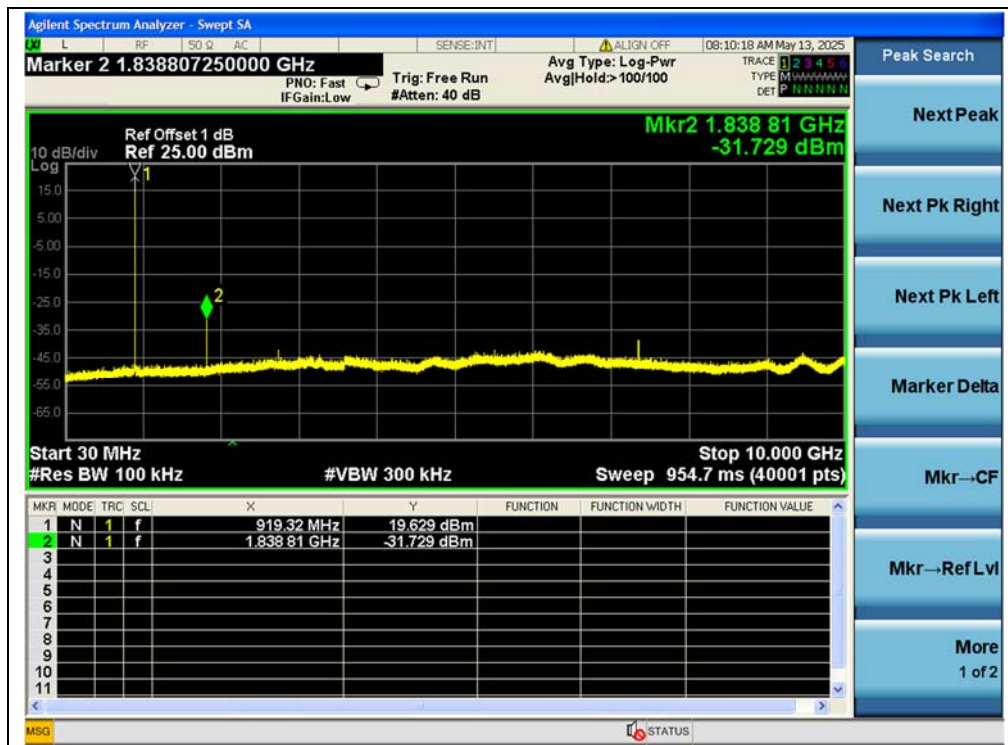
(30MHz to 10GHz, Channel 1)



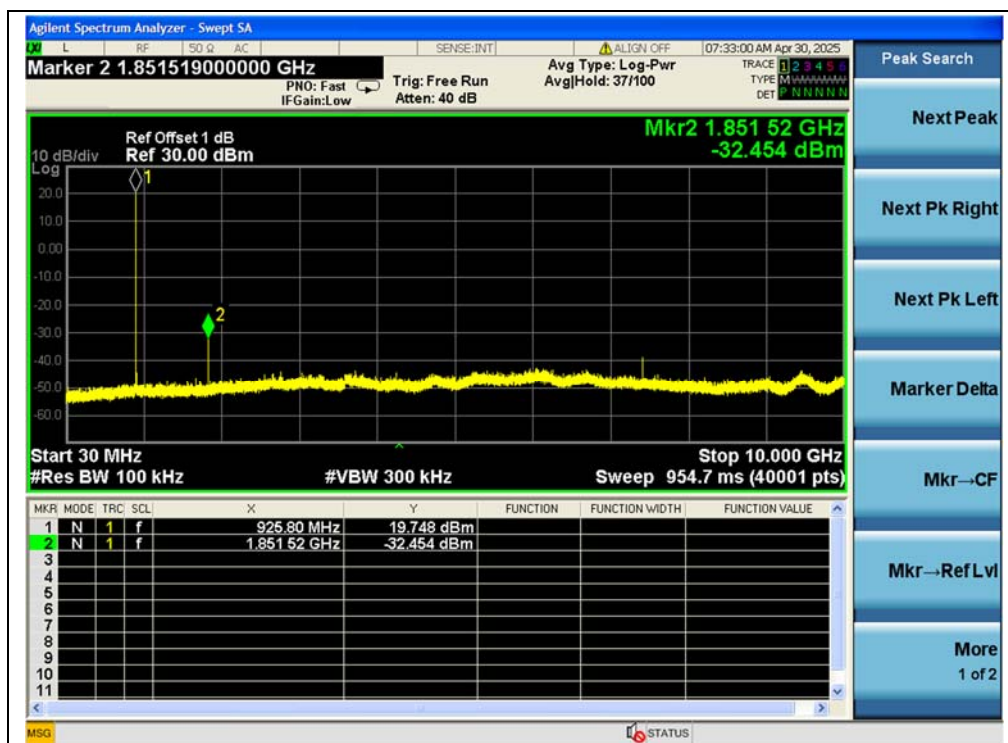
(Band edge, Channel 1)



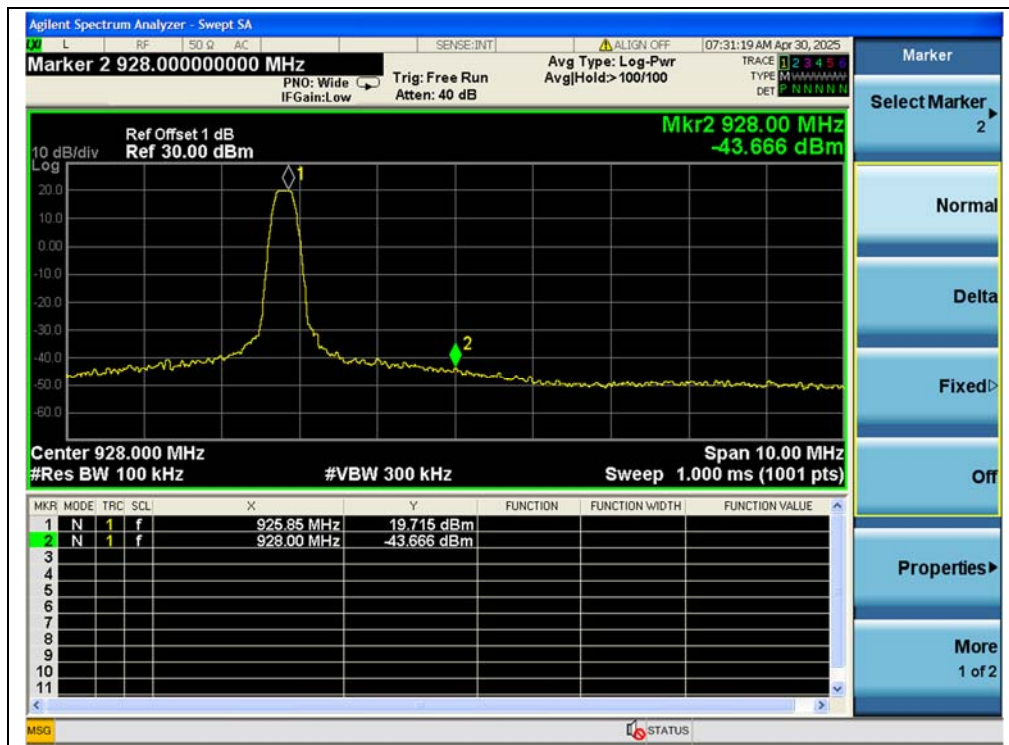
(Band edge with hopping on, Channel 1)



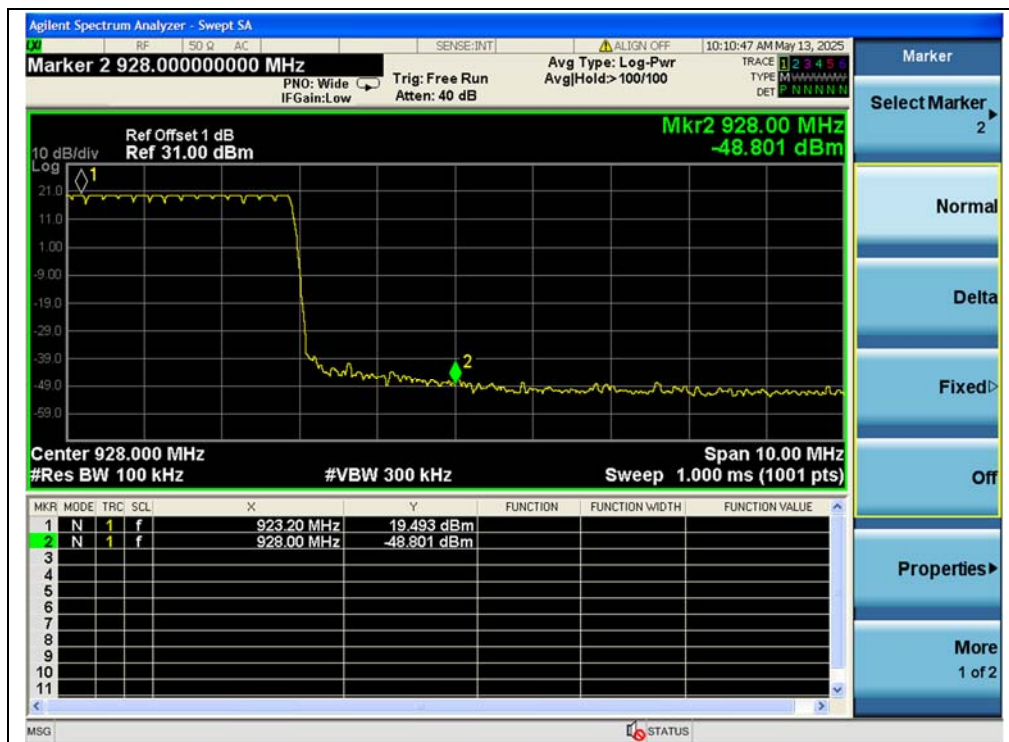
(30MHz to 10GHz, Channel 32)



(30MHz to 10GHz, Channel 64)



(Band edge, Channel 64)



(Band edge with hopping on, Channel 64)

2.11. Conducted Emission

2.11.1. 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).

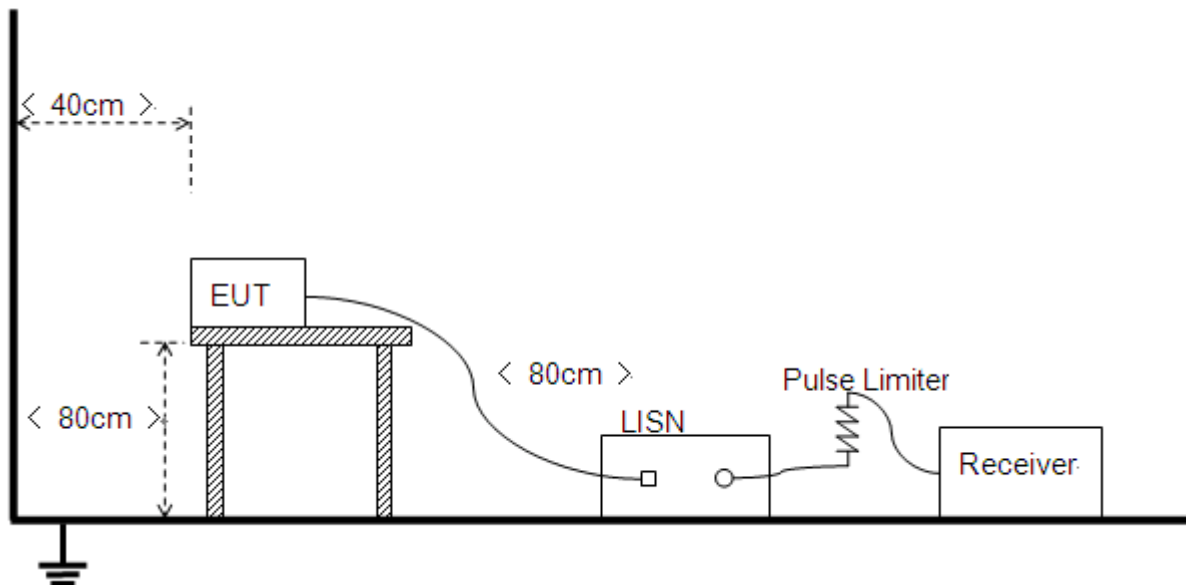
Frequency Range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5- 30	60	50

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.

2.11.2. Test Description

Test Setup:



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.



REPORT No.: SZ25010010W01

2.11.3. Test Result

This test case does not apply this kind of EUT.

2.12. Radiated Emission

2.12.1. Requirement

According to FCC section 15.247(d), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

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 ($\mu\text{V}/\text{m}$)	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

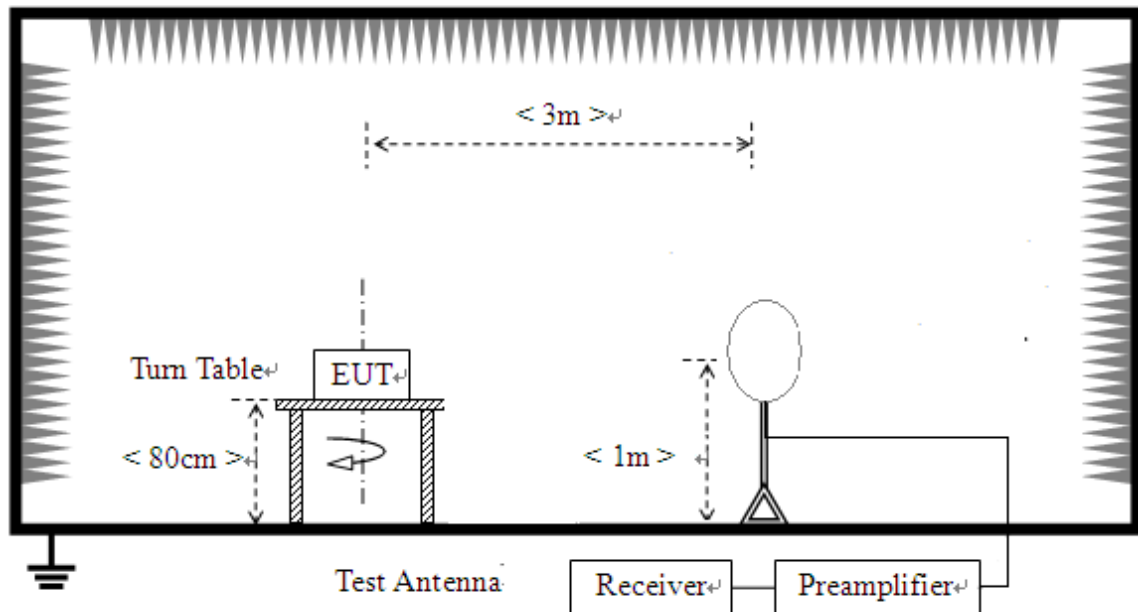
Note1: For above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

Note2: For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK). 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).

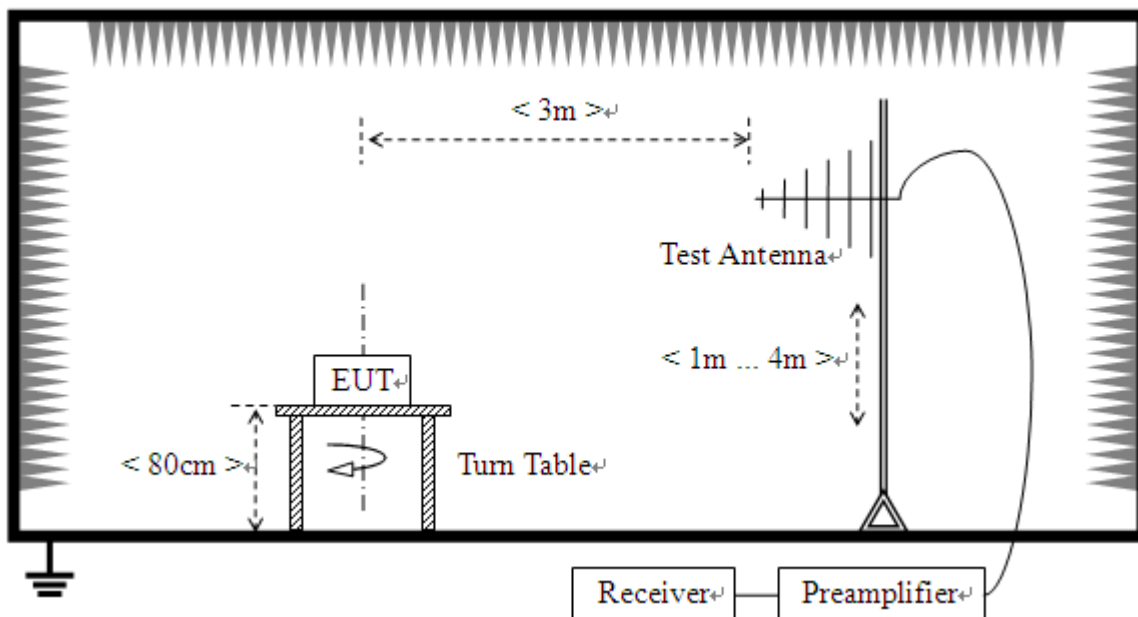
2.12.2. Test Description

Test Setup:

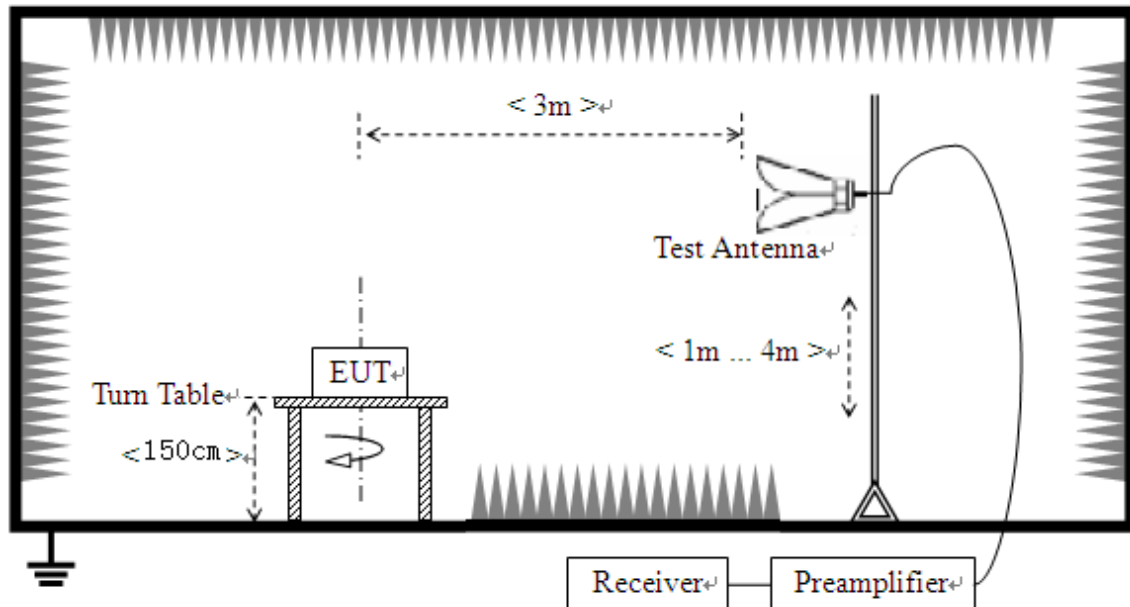
- 1) For radiated emissions from 9kHz to 30MHz



- 2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz



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 frequency range of interest is monitored at a fixed antenna height and EUT azimuth. 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.



2.12.3. Test Result

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

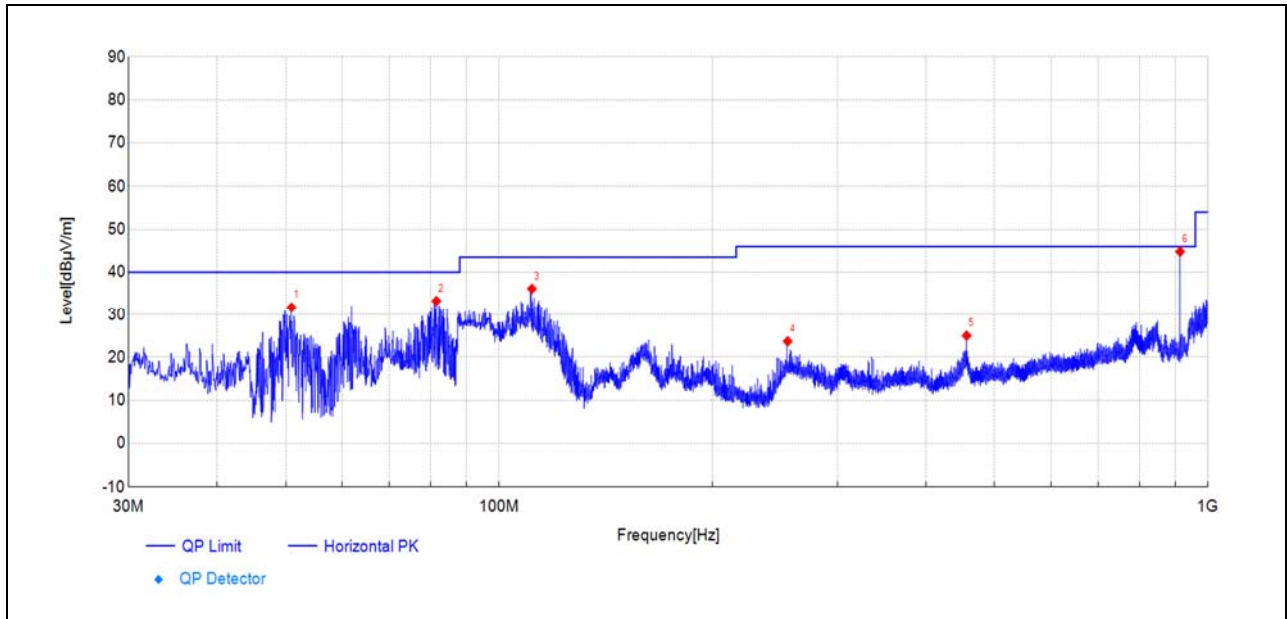
During the test, the total correction Factor A_T and A_{Factor} were built in test software.

Note 1: 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.

Note 2: 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.

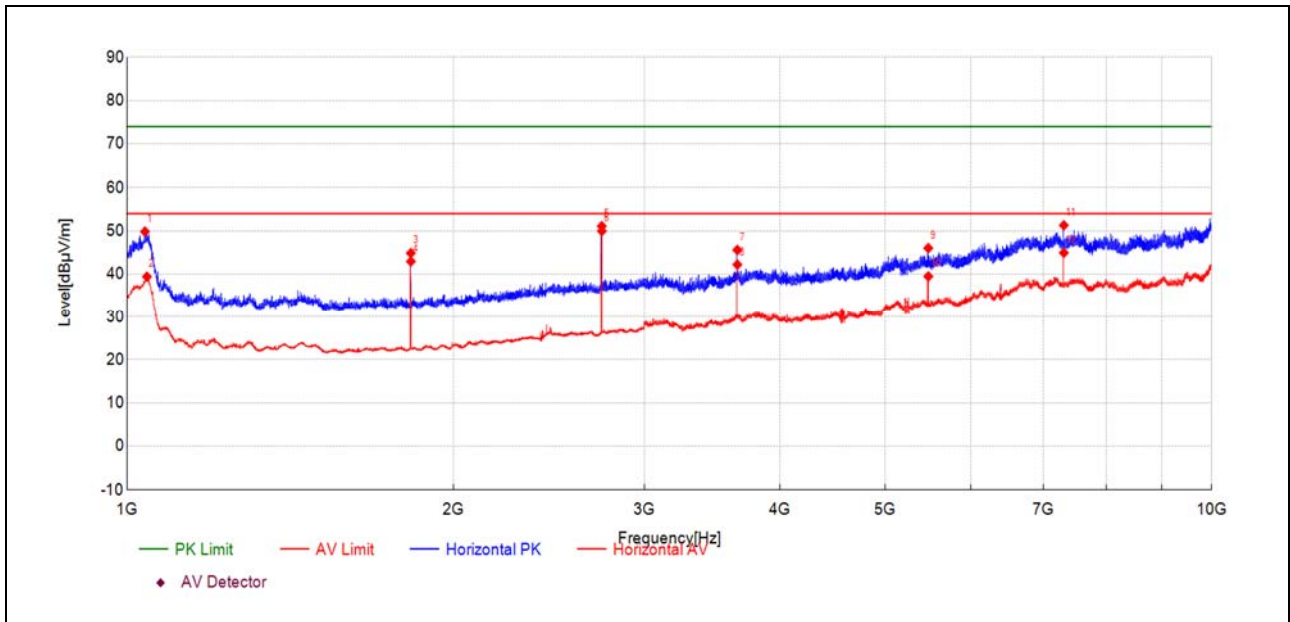
Note 3: N/A means the frequency is the basic frequency or the base station frequency, they are no need to verdict.

Plot for Channel 0



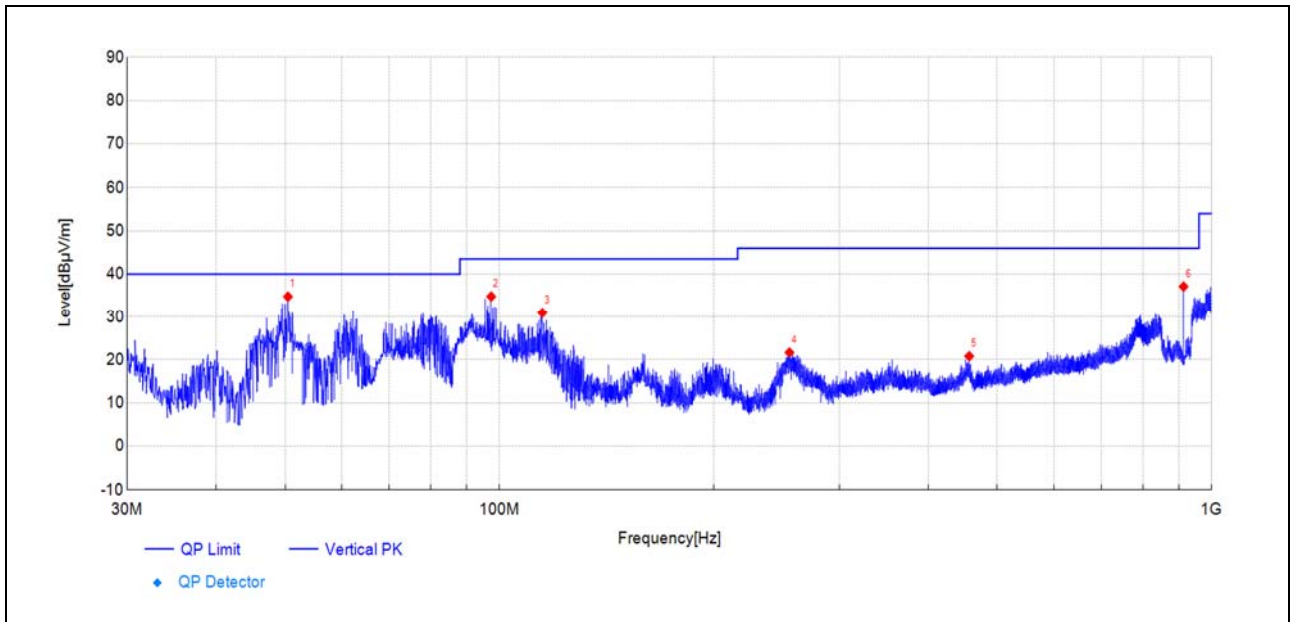
(Antenna Horizontal, 30MHz to 1GHz)

Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Polarity	Verdict
50.95	59.8	31.70	-28.090	40.00	8.30	9	PK	Horizontal	PASS
81.56	65.0	33.25	-31.780	40.00	6.75	30	PK	Horizontal	PASS
111.24	64.9	36.12	-28.750	43.50	7.38	44	PK	Horizontal	PASS
255.29	50.7	23.71	-26.970	46.00	22.29	92	PK	Horizontal	PASS
456.58	46.4	25.02	-21.340	46.00	20.98	353	PK	Horizontal	PASS
913.28	57.2	44.80	-12.390	-	-	22	PK	Horizontal	NA



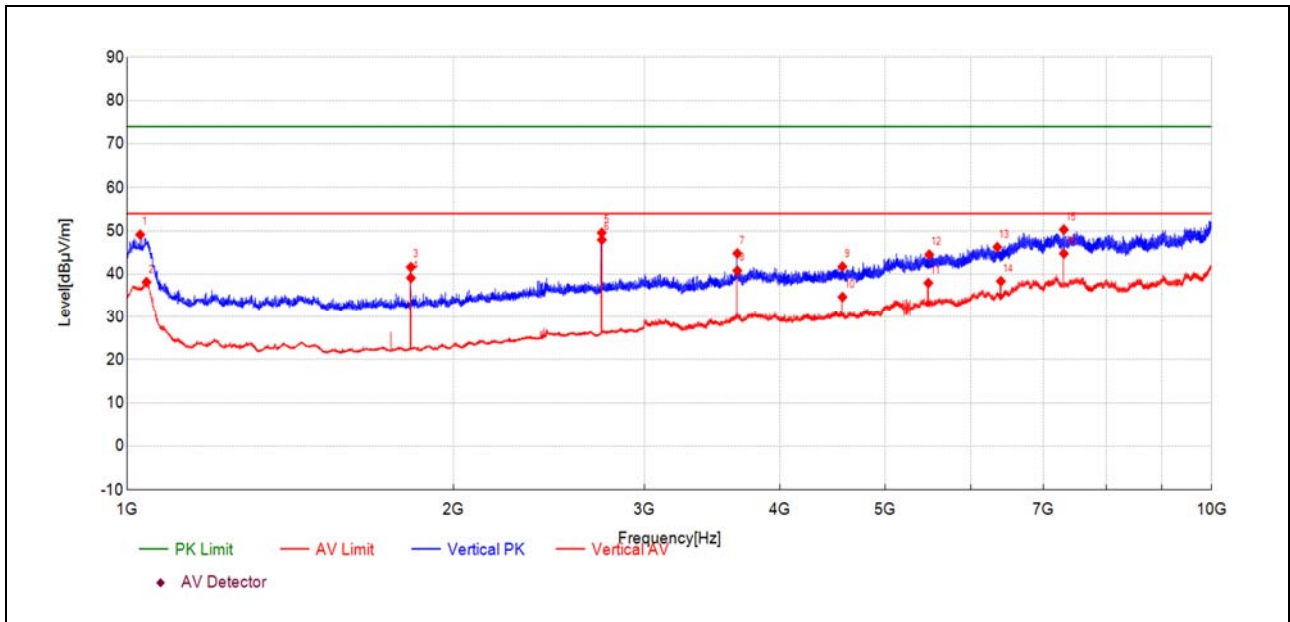
(Antenna Horizontal, 1GHz to 10GHz)

Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Polarity	Verdict
1038.81	69.7	49.85	-19.880	74.00	24.15	183	PK	Horizontal	PASS
1043.21	59.3	39.40	-19.920	54.00	14.60	183	AV	Horizontal	PASS
1826.57	63.3	44.87	-18.400	74.00	29.13	211	PK	Horizontal	PASS
1826.97	61.3	42.94	-18.400	54.00	11.06	222	AV	Horizontal	PASS
2739.55	64.0	51.12	-12.870	74.00	22.88	329	PK	Horizontal	PASS
2739.95	62.8	49.98	-12.860	54.00	4.02	329	AV	Horizontal	PASS
3652.91	54.4	45.60	-8.820	74.00	28.40	51	PK	Horizontal	PASS
3653.38	51.0	42.22	-8.820	54.00	11.78	51	AV	Horizontal	PASS
5479.10	48.1	46.01	-2.050	74.00	27.99	106	PK	Horizontal	PASS
5479.57	41.5	39.48	-2.040	54.00	14.52	114	AV	Horizontal	PASS
7305.75	47.2	51.30	4.140	74.00	22.70	225	PK	Horizontal	PASS
7305.75	40.8	44.95	4.140	54.00	9.05	201	AV	Horizontal	PASS



(Antenna Vertical, 30MHz to 1GHz)

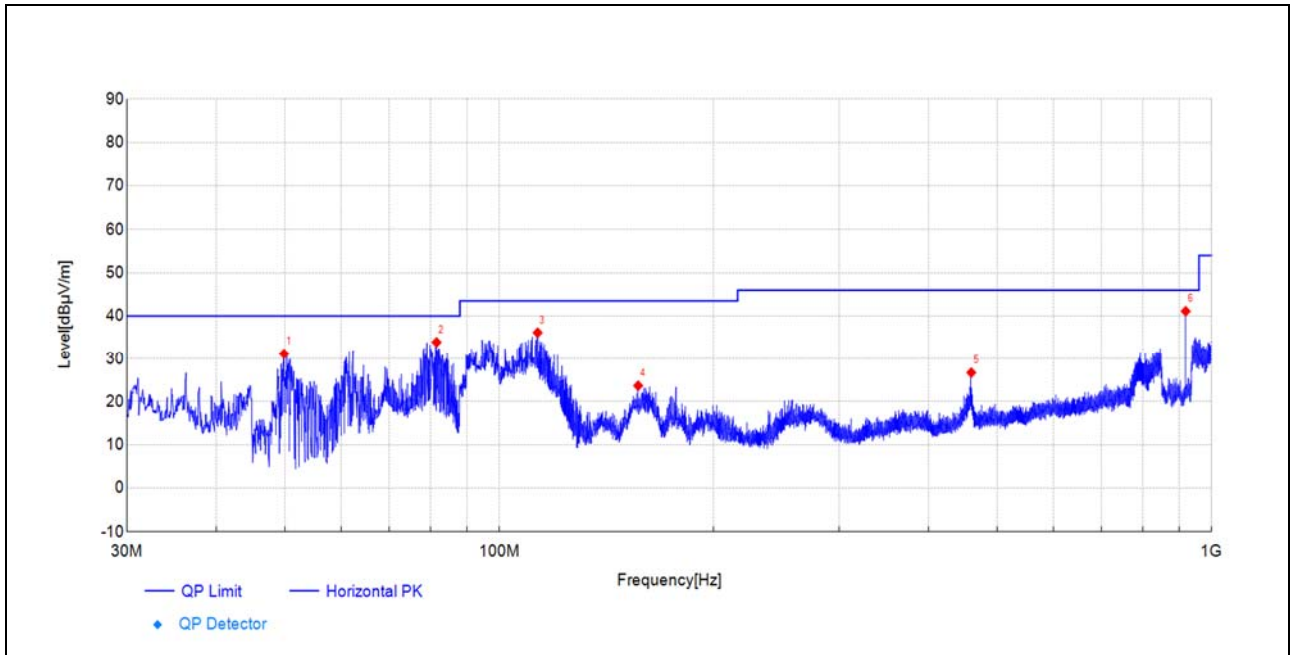
Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Polarity	Verdict
50.47	62.8	34.76	-27.990	40.00	5.24	282	PK	Vertical	PASS
97.37	64.7	34.79	-29.860	43.50	8.71	274	PK	Vertical	PASS
114.88	61.0	30.94	-30.050	43.50	12.56	274	PK	Vertical	PASS
255.34	48.6	21.66	-26.980	46.00	24.34	57	PK	Vertical	PASS
456.58	42.1	20.80	-21.340	46.00	25.20	16	PK	Vertical	PASS
913.13	49.5	37.11	-12.380	-	-	200	PK	Vertical	NA



(Antenna Vertical, 1GHz to 10GHz)

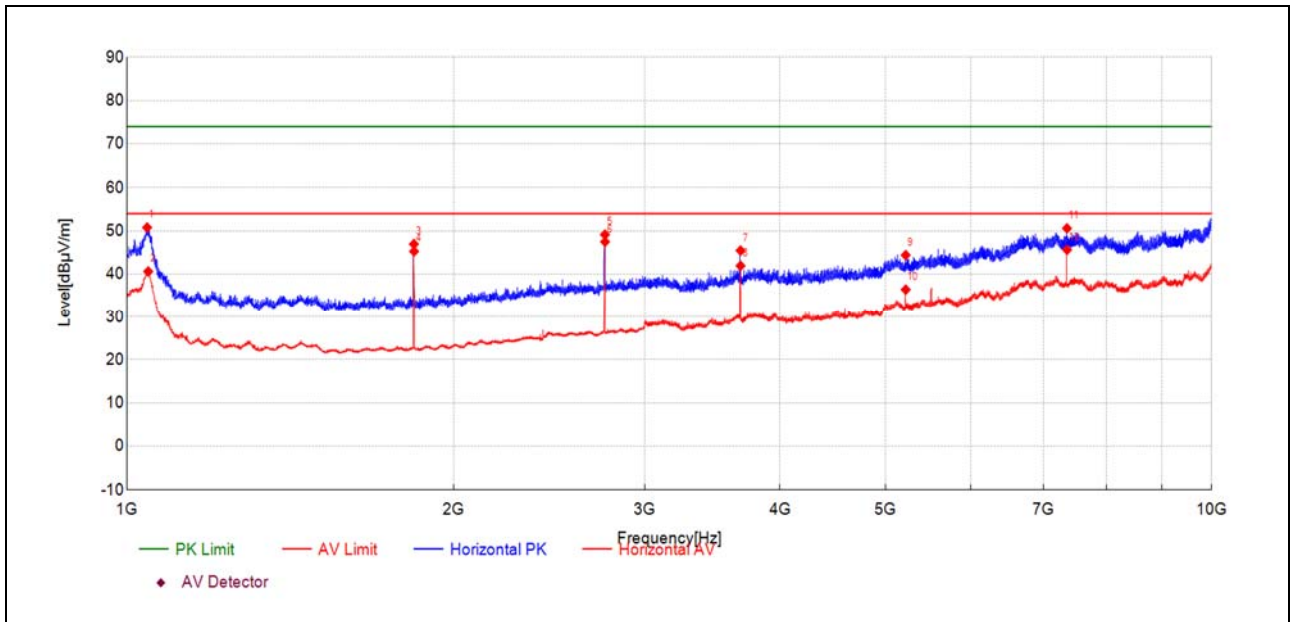
Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Polarity	Verdict
1028.41	69.0	49.14	-19.820	74.00	24.86	134	PK	Vertical	PASS
1042.41	58.1	38.14	-19.910	54.00	15.86	80	AV	Vertical	PASS
1826.57	60.0	41.62	-18.400	74.00	32.38	74	PK	Vertical	NA
1826.97	57.5	39.12	-18.400	54.00	14.88	74	AV	Vertical	PASS
2739.55	62.4	49.57	-12.870	74.00	24.43	124	PK	Vertical	PASS
2739.95	60.8	47.93	-12.860	54.00	6.07	124	AV	Vertical	PASS
3652.91	53.6	44.78	-8.820	74.00	29.22	280	PK	Vertical	PASS
3652.91	49.6	40.82	-8.820	54.00	13.18	280	AV	Vertical	PASS
4566.24	48.3	41.74	-6.520	74.00	32.26	200	PK	Vertical	PASS
4566.70	41.2	34.68	-6.520	54.00	19.32	105	AV	Vertical	PASS
5479.57	40.0	37.92	-2.040	54.00	16.08	3	AV	Vertical	PASS
5490.30	46.5	44.51	-2.000	74.00	29.49	0	PK	Vertical	PASS
6342.96	45.1	46.25	1.120	74.00	27.75	57	PK	Vertical	PASS
6392.43	37.3	38.36	1.040	54.00	15.64	48	AV	Vertical	PASS
7305.75	46.2	50.30	4.140	74.00	23.70	57	PK	Vertical	PASS

Plot for Channel 32



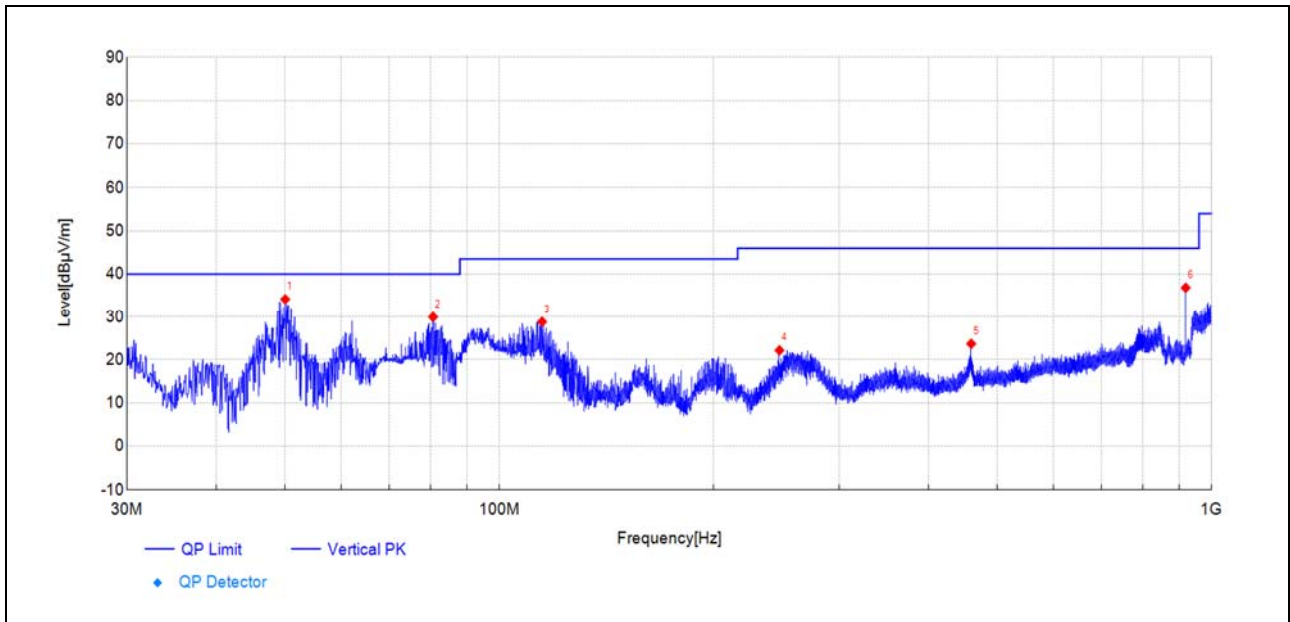
(Antenna Horizontal, 30MHz to 1GHz)

Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Polarity	Verdict
49.84	59.1	31.16	-27.980	40.00	8.84	9	PK	Horizontal	PASS
81.61	65.7	33.89	-31.770	40.00	6.11	9	PK	Horizontal	PASS
113.13	65.4	36.13	-29.270	43.50	7.37	346	PK	Horizontal	PASS
156.59	55.3	23.67	-31.590	43.50	19.83	86	PK	Horizontal	PASS
459.73	47.9	26.71	-21.160	46.00	19.29	357	PK	Horizontal	PASS
919.39	52.9	41.11	-11.790	-	-	250	PK	Horizontal	NA



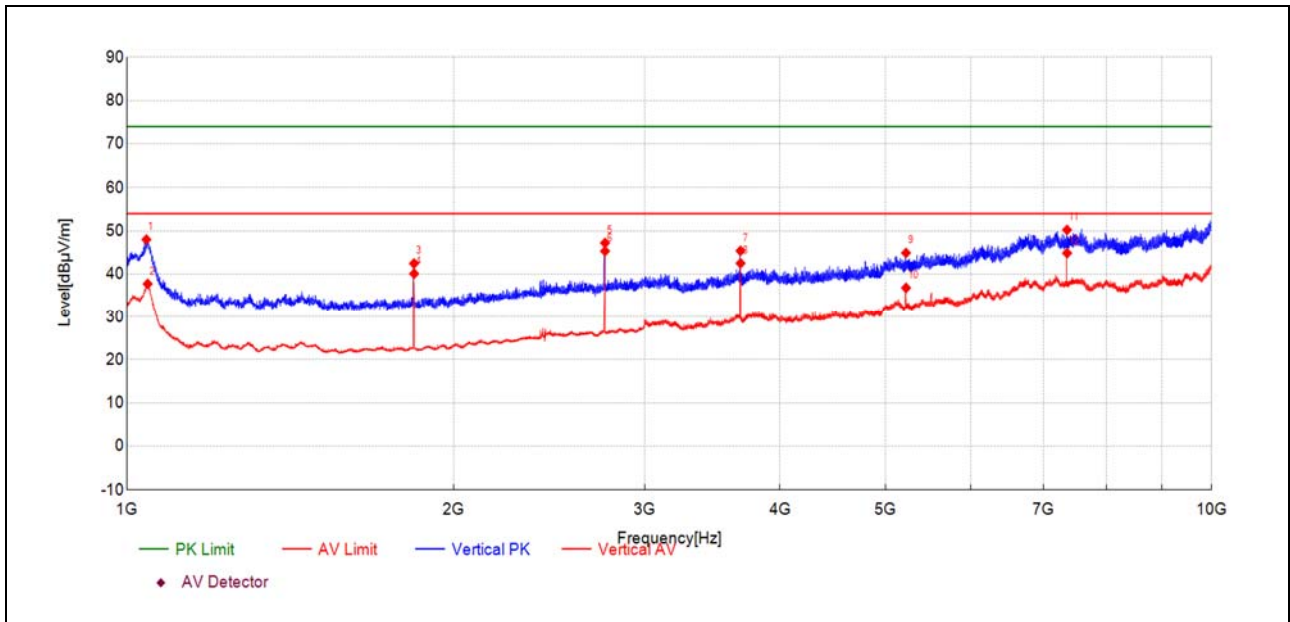
(Antenna Horizontal, 1GHz to 10GHz)

Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Polarity	Verdict
1043.61	70.7	50.78	-19.930	74.00	23.22	301	PK	Horizontal	PASS
1046.01	60.6	40.62	-19.940	54.00	13.38	296	AV	Horizontal	PASS
1838.57	65.3	46.96	-18.340	74.00	27.04	296	PK	Horizontal	PASS
1839.37	63.6	45.28	-18.330	54.00	8.72	296	AV	Horizontal	PASS
2757.95	61.9	49.14	-12.730	74.00	24.86	167	PK	Horizontal	PASS
2758.75	60.2	47.49	-12.730	54.00	6.51	162	AV	Horizontal	PASS
3677.65	54.5	45.46	-9.060	74.00	28.54	90	PK	Horizontal	PASS
3678.11	51.0	41.93	-9.060	54.00	12.07	90	AV	Horizontal	PASS
5222.41	47.7	44.40	-3.290	74.00	29.60	210	PK	Horizontal	PASS
5222.88	39.7	36.40	-3.290	54.00	17.60	210	AV	Horizontal	PASS
7355.22	46.1	50.60	4.540	74.00	23.40	138	PK	Horizontal	PASS
7355.69	41.1	45.64	4.540	54.00	8.36	138	AV	Horizontal	PASS



(Antenna Vertical, 30MHz to 1GHz)

Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Polarity	Verdict
50.03	62.1	34.14	-27.920	40.00	5.86	302	PK	Vertical	PASS
80.69	62.1	29.92	-32.130	40.00	10.08	282	PK	Vertical	PASS
114.78	58.8	28.79	-29.980	43.50	14.71	282	PK	Vertical	PASS
247.24	49.3	22.16	-27.140	46.00	23.84	82	PK	Vertical	PASS
459.63	44.9	23.68	-21.170	46.00	22.32	282	PK	Vertical	PASS
919.39	48.6	36.84	-11.790	-	-	95	PK	Vertical	NA

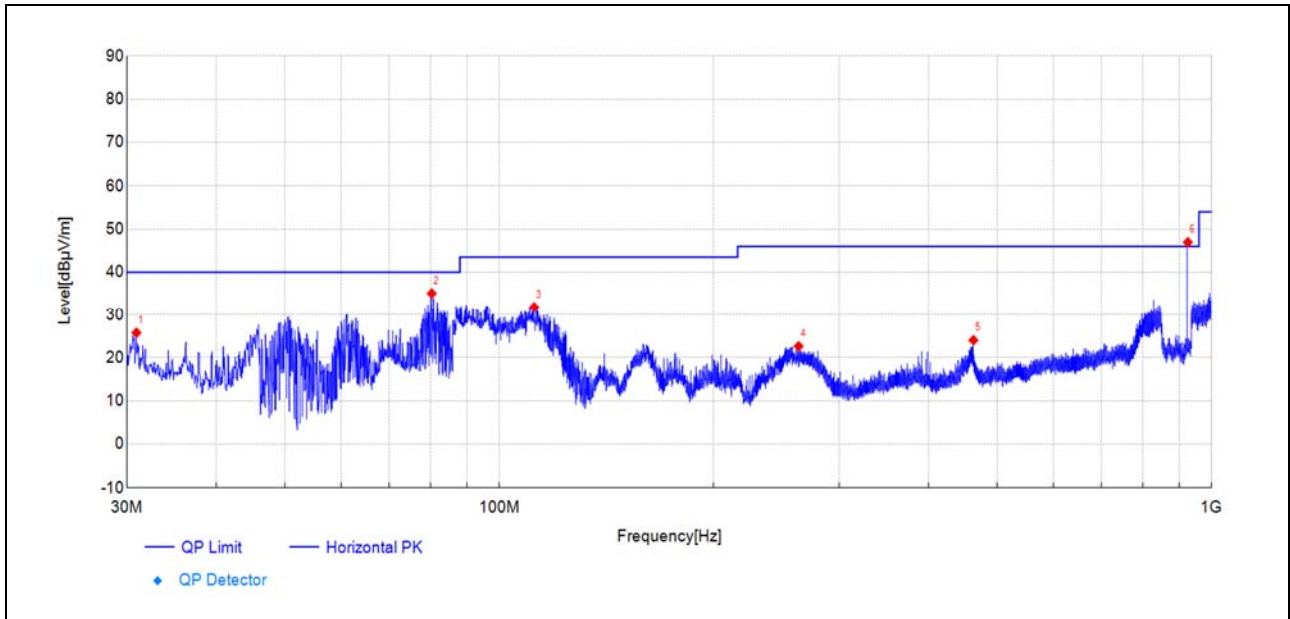


(Antenna Vertical, 1GHz to 10GHz)

Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Polarity	Verdict
1042.01	67.9	48.01	-19.910	74.00	25.99	144	PK	Vertical	PASS
1044.81	57.7	37.74	-19.930	54.00	16.26	144	AV	Vertical	PASS
1838.97	60.8	42.46	-18.340	74.00	31.54	328	PK	Vertical	PASS
1839.37	58.4	40.11	-18.330	54.00	13.89	128	AV	Vertical	PASS
2758.35	59.9	47.21	-12.730	74.00	26.79	219	PK	Vertical	PASS
2758.75	58.1	45.33	-12.730	54.00	8.67	219	AV	Vertical	PASS
3677.65	54.5	45.40	-9.060	74.00	28.60	201	PK	Vertical	PASS
3678.11	51.6	42.52	-9.060	54.00	11.48	208	AV	Vertical	PASS
5226.15	48.1	44.91	-3.230	74.00	29.09	256	PK	Vertical	PASS
5226.62	40.0	36.82	-3.220	54.00	17.18	256	AV	Vertical	PASS
7355.69	45.7	50.23	4.540	74.00	23.77	295	PK	Vertical	PASS
7355.69	40.3	44.86	4.540	54.00	9.14	288	AV	Vertical	PASS

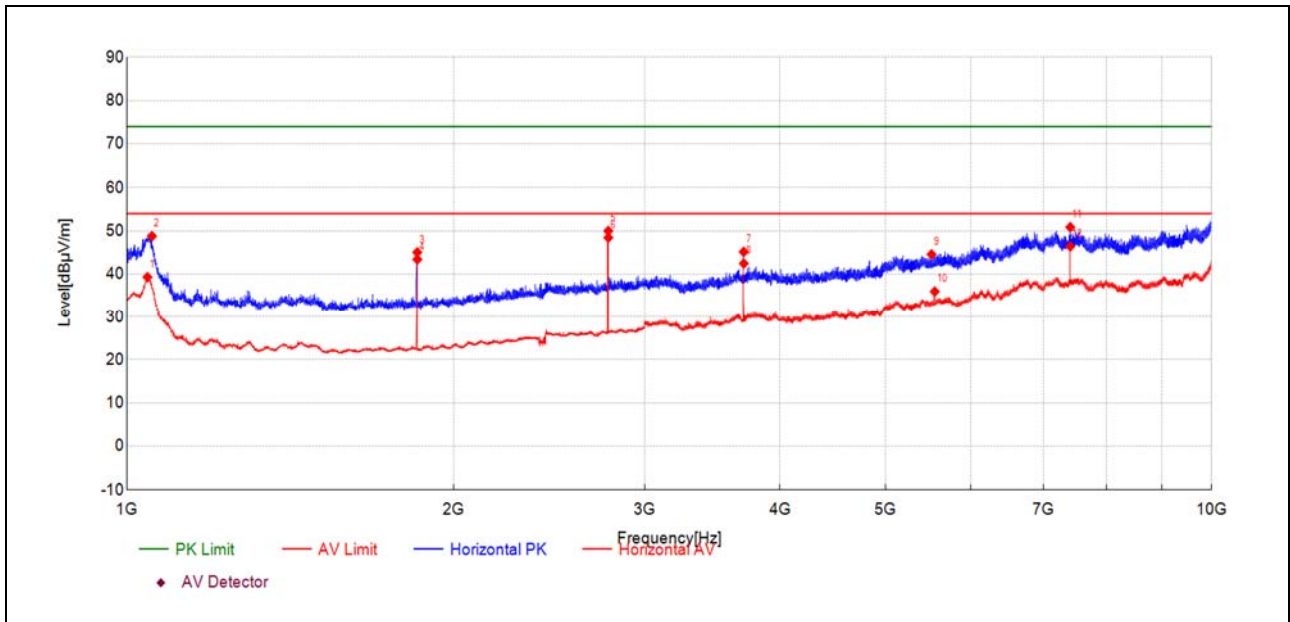


Plot for Channel 64



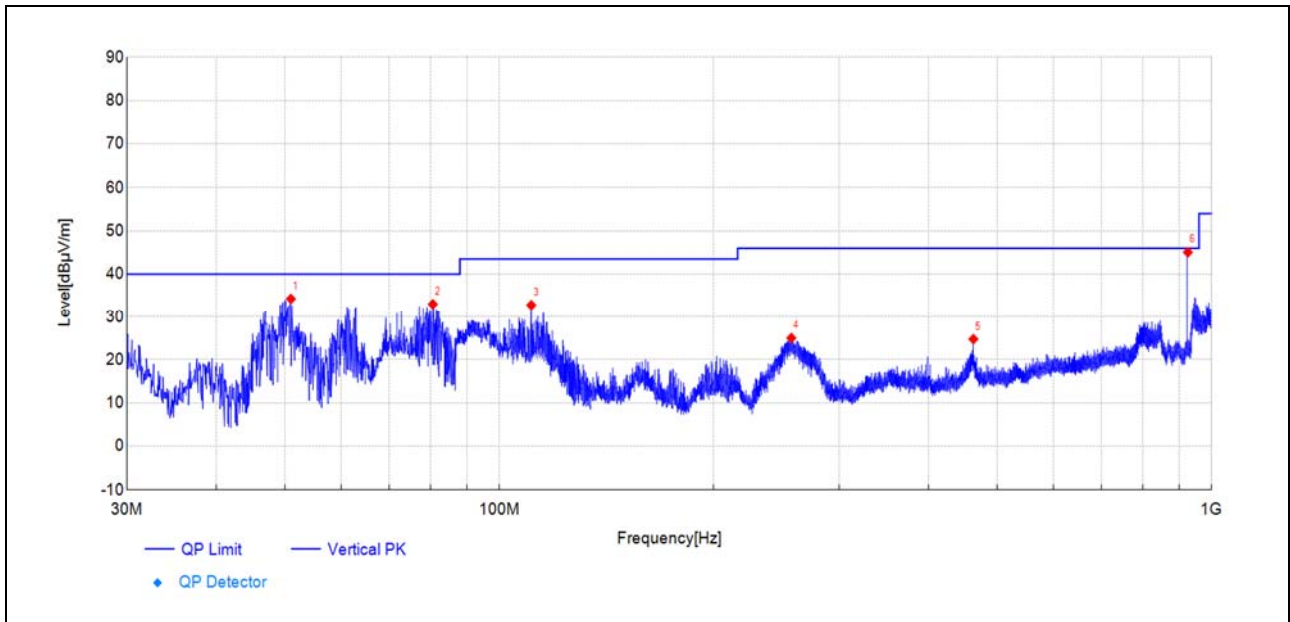
(Antenna Horizontal, 30MHz to 1GHz)

Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Polarity	Verdict
30.92	56.4	25.76	-30.620	40.00	14.24	107	PK	Horizontal	PASS
80.35	67.4	35.06	-32.300	40.00	4.94	9	PK	Horizontal	PASS
111.87	60.8	31.81	-29.000	43.50	11.69	23	PK	Horizontal	PASS
263.01	50.1	22.62	-27.460	46.00	23.38	79	PK	Horizontal	PASS
462.93	45.6	24.02	-21.570	46.00	21.98	353	PK	Horizontal	PASS
925.79	59.1	46.95	-12.120	-	-	203	PK	Horizontal	NA



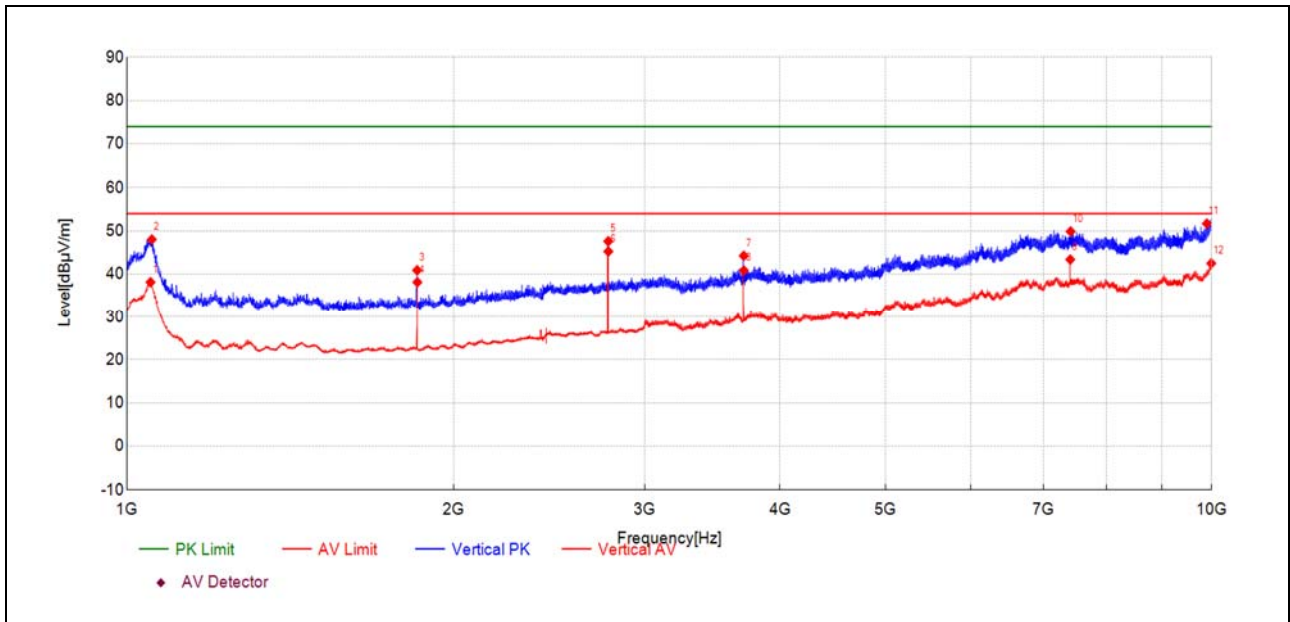
(Antenna Horizontal, 1GHz to 10GHz)

Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Polarity	Verdict
1044.41	59.2	39.31	-19.920	54.00	14.69	42	AV	Horizontal	PASS
1054.41	68.8	48.78	-19.990	74.00	25.22	253	PK	Horizontal	PASS
1851.77	63.3	45.05	-18.270	74.00	28.95	269	PK	Horizontal	PASS
1852.17	61.7	43.41	-18.270	54.00	10.59	275	AV	Horizontal	PASS
2777.56	62.8	50.00	-12.750	74.00	24.00	30	PK	Horizontal	PASS
2777.96	61.2	48.44	-12.750	54.00	5.56	30	AV	Horizontal	PASS
3702.85	54.4	45.17	-9.240	74.00	28.83	72	PK	Horizontal	PASS
3703.78	51.7	42.46	-9.220	54.00	11.54	72	AV	Horizontal	PASS
5517.37	46.7	44.58	-2.090	74.00	29.42	215	PK	Horizontal	PASS
5555.17	38.2	35.97	-2.230	54.00	18.03	287	AV	Horizontal	PASS
7406.56	46.2	50.87	4.720	74.00	23.13	96	PK	Horizontal	PASS
7407.03	41.7	46.42	4.720	54.00	7.58	88	AV	Horizontal	PASS



(Antenna Vertical, 30MHz to 1GHz)

Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Polarity	Verdict
50.95	62.3	34.25	-28.090	40.00	5.75	274	PK	Vertical	PASS
80.64	65.2	33.00	-32.150	40.00	7.00	254	PK	Vertical	PASS
110.85	61.4	32.79	-28.650	43.50	10.71	309	PK	Vertical	PASS
256.94	52.3	25.00	-27.260	46.00	21.00	56	PK	Vertical	PASS
462.84	46.3	24.75	-21.550	46.00	21.25	110	PK	Vertical	PASS
925.84	57.2	45.07	-12.120	-	-	213	PK	Vertical	NA



(Antenna Vertical, 1GHz to 10GHz)

Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Angle [°]	Detector	Polarity	Verdict
1051.21	58.1	38.13	-19.980	54.00	15.87	270	AV	Vertical	PASS
1054.01	68.0	48.01	-19.990	74.00	25.99	270	PK	Vertical	PASS
1851.37	59.2	40.91	-18.270	74.00	33.09	286	PK	Vertical	PASS
1852.17	56.4	38.13	-18.270	54.00	15.87	286	AV	Vertical	PASS
2777.56	60.4	47.60	-12.750	74.00	26.40	155	PK	Vertical	PASS
2777.96	58.0	45.25	-12.750	54.00	8.75	139	AV	Vertical	PASS
3703.31	53.5	44.25	-9.230	74.00	29.75	128	PK	Vertical	PASS
3703.78	50.1	40.85	-9.220	54.00	13.15	128	AV	Vertical	PASS
7406.56	38.7	43.38	4.720	54.00	10.62	246	AV	Vertical	PASS
7411.69	45.2	49.87	4.710	74.00	24.13	294	PK	Vertical	PASS
9897.79	42.5	51.68	9.200	74.00	22.32	223	PK	Vertical	PASS
9991.13	32.1	42.49	10.400	54.00	11.51	24	AV	Vertical	PASS

Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test Items	Uncertainty
Number of Hopping Frequency	±5%
Peak Output Power	±2.22dB
20dB Bandwidth	±5%
Carrier Frequency Separation	±5%
Time of Occupancy (Dwell time)	±5%
Conducted Spurious Emission	±2.77dB
Restricted Frequency Bands	±5%
Radiated Emission	±2.95dB
Conducted Emission	±2.44dB

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



Annex B Testing Laboratory Information

1. Identification of the Responsible 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

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.



4. Test Equipment Utilized

4.1 Conducted Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
EXA Signal Analyzer	MY53470836	N9010A	Agilent	2025.01.15	2026.01.14
RF Cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
SMA Connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

4.2 Radiated Test Equipment

Equipment	Serial No.	Model No.	Manufacturer	Cal. Date	Due Date
Signal Analyzer	MY56060145	N9020A	Agilent	2024.05.30	2025.05.29
				2025.05.13	2026.05.12
Test Antenna - Bi-Log	9163-274	VULB 9163	Schwarzbeck	2024.06.29	2025.06.28
				2025.06.28	2026.06.27
Test Antenna - Horn	BBHA 9170#773	BBHA 9170	Schwarzbeck	2024.06.22	2025.06.21
				2025.06.20	2026.06.19
Test Antenna -Horn	9120D-963	BBHA 9120D	Schwarzbeck	2024.06.03	2025.06.02
				2025.05.16	2026.05.15
Signal Generator	203403	MG3692C	anritsu	2024.09.11	2025.09.10
Preamplifier (10MHz-6GHz)	46732	S10M100L38 02	LUCIX CORP.	N/A	N/A
Preamplifier (2GHz-18GHz)	61171/61172	S020180L32 03	LUCIX CORP.	N/A	N/A
Preamplifier (18GHz-40GHz)	DS77209	DCLNA0118-40C-S	Decentest	N/A	N/A
RF Coaxial Cable (DC-18GHz)	MRE001	PE330	Pasternack	N/A	N/A
RF Coaxial Cable (DC-18GHz)	MRE002	CLU18	Pasternack	N/A	N/A
RF Coaxial Cable (DC-18GHz)	MRE003	CLU18	Pasternack	N/A	N/A
RF Coaxial Cable (DC-40GHz)	22290045	QA360-40-KK-0.5	Qualwave	N/A	N/A
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40-KKF-2	Qualwave	N/A	N/A
RF Coaxial Cable	22120181	QA500-18-	Qualwave	N/A	N/A



REPORT No.: SZ25010010W01

(DC-18GHz)		NN-5			
Anechoic Chamber	N/A	9m*6m*6m	CRT	2025.04.19	2028.04.18
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.11.30	2025.11.29

4.3 List of Software Used

Description	Manufacturer	Software Version
JS32-RE	Tonscend	5.0.0

_____ END OF REPORT _____