



# TEST REPORT

**APPLICANT** : Shenzhen Chainway Information Technology Co., Ltd

**PRODUCT NAME** : Mobile Data Terminal

**MODEL NAME** : C5

**BRAND NAME** : CHAINWAY

**FCC ID** : 2AC6AC5N

**STANDARD(S)** : 47 CFR Part 15 Subpart C

**RECEIPT DATE** : 2025-04-30

**TEST DATE** : 2025-05-15 to 2025-05-22

**ISSUE DATE** : 2025-07-11

Edited by:

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Change History		
Version	Date	Reason for change
1.0	2025-07-11	First edition



# 1. Technical Information

**Note:** Provide by applicant.

## 1.1. Applicant and Manufacturer Information

<b>Applicant:</b>	Shenzhen Chainway Information Technology Co., Ltd
<b>Applicant Address:</b>	9F Building 2, Daqian Industrial Park, District 67, XingDong Community, Xin'an Street, Bao'an District, Shenzhen, Guangdong, China
<b>Manufacturer:</b>	Shenzhen Chainway Information Technology Co., Ltd
<b>Manufacturer Address:</b>	9F Building 2, Daqian Industrial Park, District 67, XingDong Community, Xin'an Street, Bao'an District, Shenzhen, Guangdong, China

## 1.2. Equipment Under Test (EUT) Description

<b>Product Name:</b>	Mobile Data Terminal
<b>Sample No.:</b>	1#; 3#
<b>Hardware Version:</b>	C5P_Software_version
<b>Software Version:</b>	C5P_Hardware_version
<b>Operating Frequency:</b>	13.56MHz
<b>Modulation Type:</b>	ASK
<b>Antenna Type:</b>	Coil Antenna
<b>Accessory Information:</b>	Battery 1(for EUT)
	Brand Name: Chainway
	Model No.: C5
	Serial No.:
	N/A
	Capacity: 6300mAh
	Rated Voltage: 3.6V
	Charge Limit: 4.2V
	Manufacturer: DONGGUAN BOB ELECTRONICS CO.,LTD



<b>Accessory Information:</b>	Battery 2(for EUT handle)	
	Brand Name:	ZOUYOU
	Model No.:	501030
	Serial No.:	N/A
	Capacity:	100mAh
	Rated Voltage:	3.7V
	Charge Limit:	4.2V
	Manufacturer:	Shenzhen Zonyou Power Co., Ltd.
	AC Adapter	
	Brand Name:	ULLPOWER
	Model No.:	NA010050020
	Serial No.:	N/A
	Rated Input:	100-240V~50/60Hz, 0.5A
	Rated Output:	5V--2A
	Manufacturer:	Shenzhen Shi Yingyuan Electronics Co., Ltd
USB Cable		
Model:	1.8.17.095	
Manufacturer:	King Power Electronics Co., Ltd.	

**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. 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 (10-1-15 Edition)	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	15.207	Conducted Emission	May 15, 2025	Gao Jianrou	PASS	/
3	15.209 15.225(a) (b) (c)(d)	Radiated Emission	May 15, 2025	Gao Jianrou	PASS	/
4	15.225(e)	Frequency Tolerance	May 22, 2025	Li Zikai	PASS	/
5	15.215(c)	20dB Bandwidth	May 15, 2025	Gao Jianrou	PASS	/

**Note 1:** The tests were performed according to the method of measurements prescribed in ANSI C63.10-2013. The EUT has been tested under continuous operating condition.

**Note 2:** Any additions, deviation, or exclusions from the method shall be noted in the "Remark".

## 1.4. 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
<input checked="" type="checkbox"/> Internal <input type="checkbox"/> External	<input type="checkbox"/> FPC Antenna <input type="checkbox"/> Spring Antenna <input type="checkbox"/> Ceramic Antenna <input type="checkbox"/> Integrated Antenna <input type="checkbox"/> Dipole Antenna <input checked="" type="checkbox"/> PCB Antenna <input type="checkbox"/> Inverted F Antenna	<input type="checkbox"/> I-PEX Connector <input type="checkbox"/> SMA Connector <input type="checkbox"/> RP-SMA Connector <input type="checkbox"/> Metal Shrapnel <input checked="" type="checkbox"/> Layout

## 2.2. Conducted Emission

### 2.2.1. Test Requirement

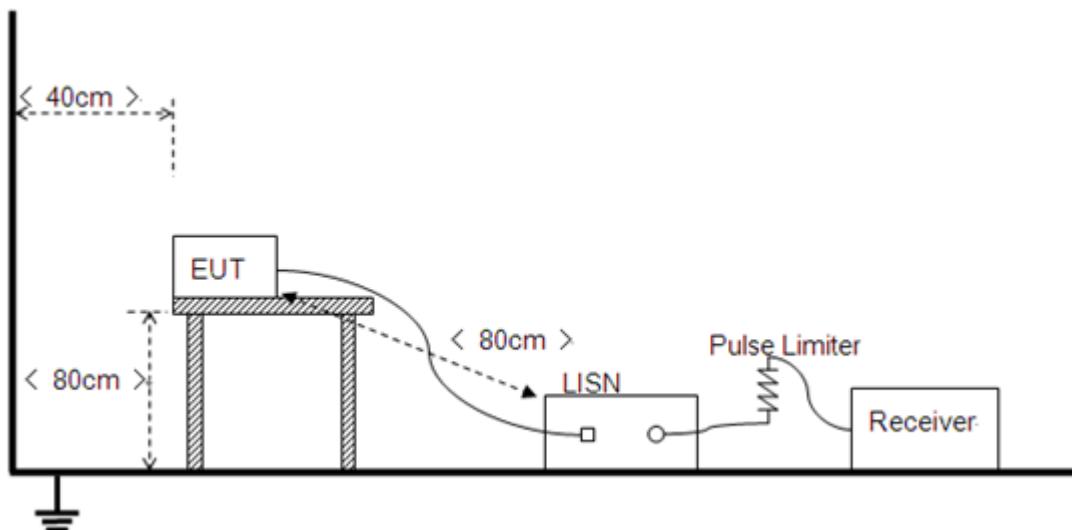
According to FCC section 15.207, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

Frequency Range (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-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.

### 2.2.2. Test Setup



The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50 $\Omega$ /50 $\mu$ H of coupling impedance for the measuring instrument. A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.



### 2.2.3. Test Result

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Set RBW=9kHz, VBW=30kHz. Refer to recorded points and plots below.

**Note:** Both of the test voltage AC 120V/60Hz and AC 230V/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

#### A. Test Setup:

Test Mode: EUT+Adapter+Data cable+Earphone+13.56MHz TX

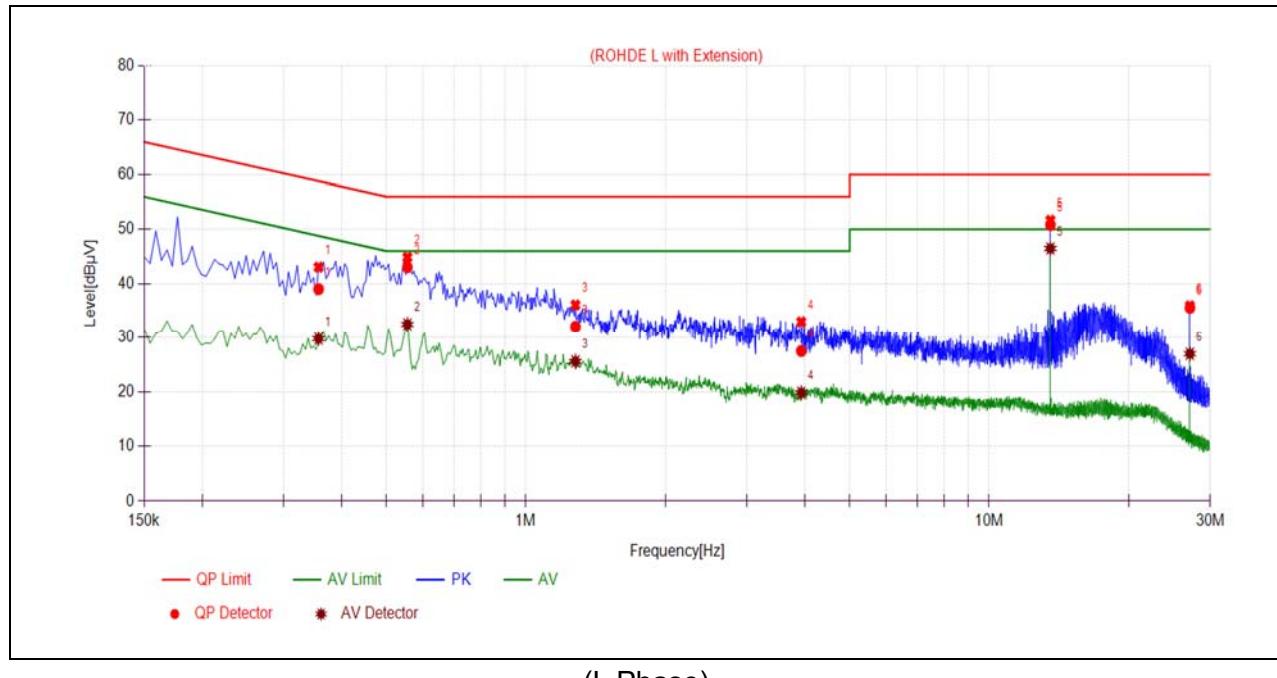
Test voltage: AC 120V/60Hz

The measurement results are obtained as below:

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

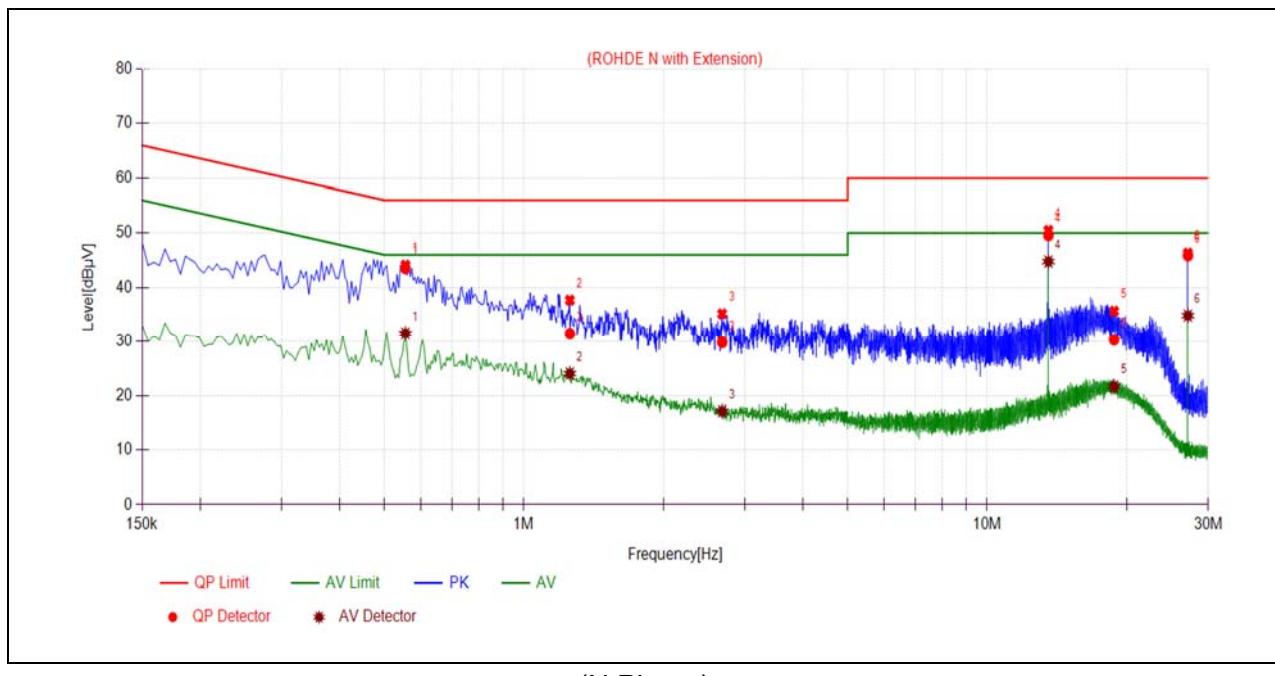
$U_R$ : Receiver Reading

$A_{\text{Factor}}$ : Voltage division factor of LISN

**B. Test Plot:**


(L Phase)

No.	Fre. (MHz)	Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.3570	39.01	29.76	58.80	48.80	Line	PASS
2	0.5550	43.04	32.48	56.00	46.00		PASS
3	1.2796	32.06	25.56	56.00	46.00		PASS
4	3.9297	27.48	19.79	56.00	46.00		PASS
5	13.5588	50.82	46.49	60.00	50.00		PASS
6	27.1199	35.54	26.96	60.00	50.00		PASS



No.	Fre. (MHz)	Emission Level (dB $\mu$ V)		Limit (dB $\mu$ V)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.5550	43.57	31.52	56.00	46.00	Neutral	PASS
2	1.2570	31.46	24.04	56.00	46.00		PASS
3	2.6789	29.82	17.10	56.00	46.00		PASS
4	13.5592	49.61	44.78	60.00	50.00		PASS
5	18.7884	30.34	21.64	60.00	50.00		PASS
6	27.1202	45.91	34.85	60.00	50.00		PASS



## 2.3. Radiated Emission

### 2.3.1. Test Requirement

#### Radiated Emission <30MHz (9 kHz-30MHz, E-field)

According to FCC section 15.225, for <30MHz, Radiated emissions were measured according to ANSIC63.4. The EUT was set to transmit at the highest output power. The EUT was set 30 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the center of the loop. The measuring bandwidth was set to 10KHz. (Note: During testing the receive antenna was rotated about its axis to maximize the emission from the EUT)

There was no detected Restricted bands and Radiated Spurious emission below 30MHz. The 30m limit was converted to 3m Limit using square factor(x) as it was found by measurements as follows;

$$3 \text{ m Limit(dBuV/m)} = 20\log(X) + 40\log(30/3) = 20\log(15848) + 40\log(30/3) = 124 \text{ dBuV}$$

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 Range (MHz)	Field Strength@30m		Field Strength@3m
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
Below 13.110	30	29.5	69.5
13.110 ~ 13.410	106	40.5	80.5
13.410 ~ 13.553	334	50.5	90.5
13.553 ~13.567	15.848	84	124
13.567 ~ 13.710	334	50.5	90.5
13.710 ~14.010	106	40.5	80.5
Above 14.010	30	29.5	69.5

NOTE: a) Field Strength ( $\text{dB}\mu\text{V/m}$ ) =  $20\log[\text{Field Strength } (\mu\text{V/m})]$ .

b) In the emission tables above, the tighter limit applies at the band edges.

#### Radiated Emission >30MHz (30MHz-1GHz, E-field)

According to FCC section 15.205, the field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the following values:

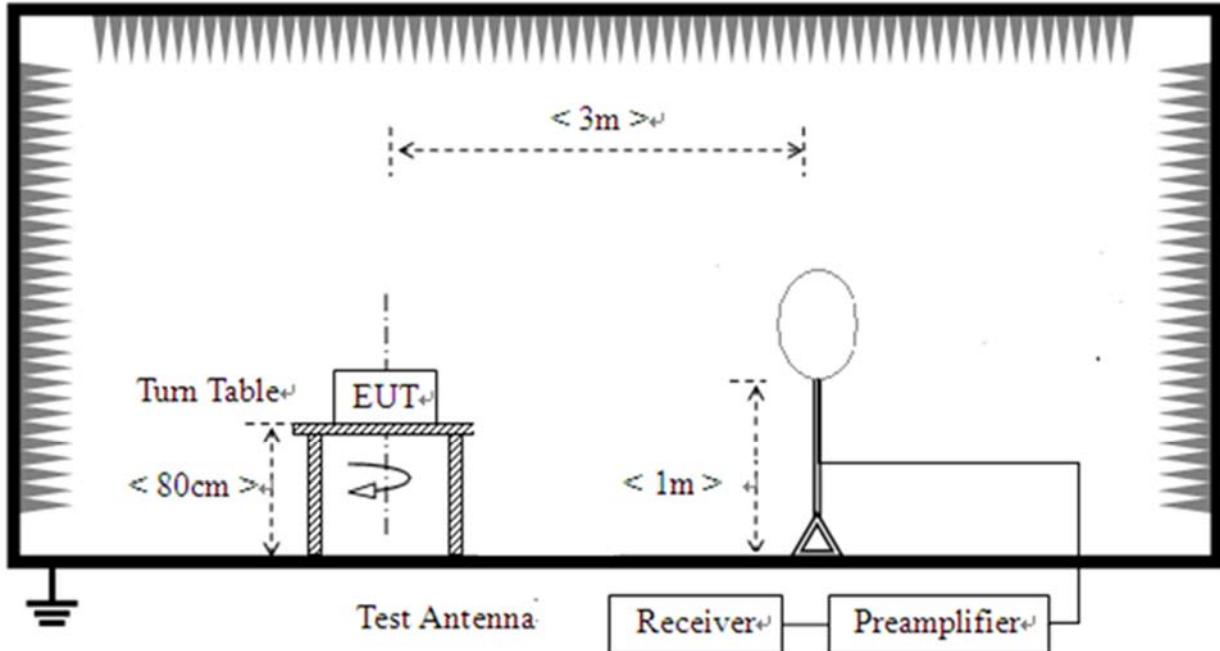
Frequency Range (MHz)	Field Strength	
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

NOTE: a) Field Strength ( $\text{dB}\mu\text{V/m}$ ) =  $20\log[\text{Field Strength } (\mu\text{V/m})]$ .

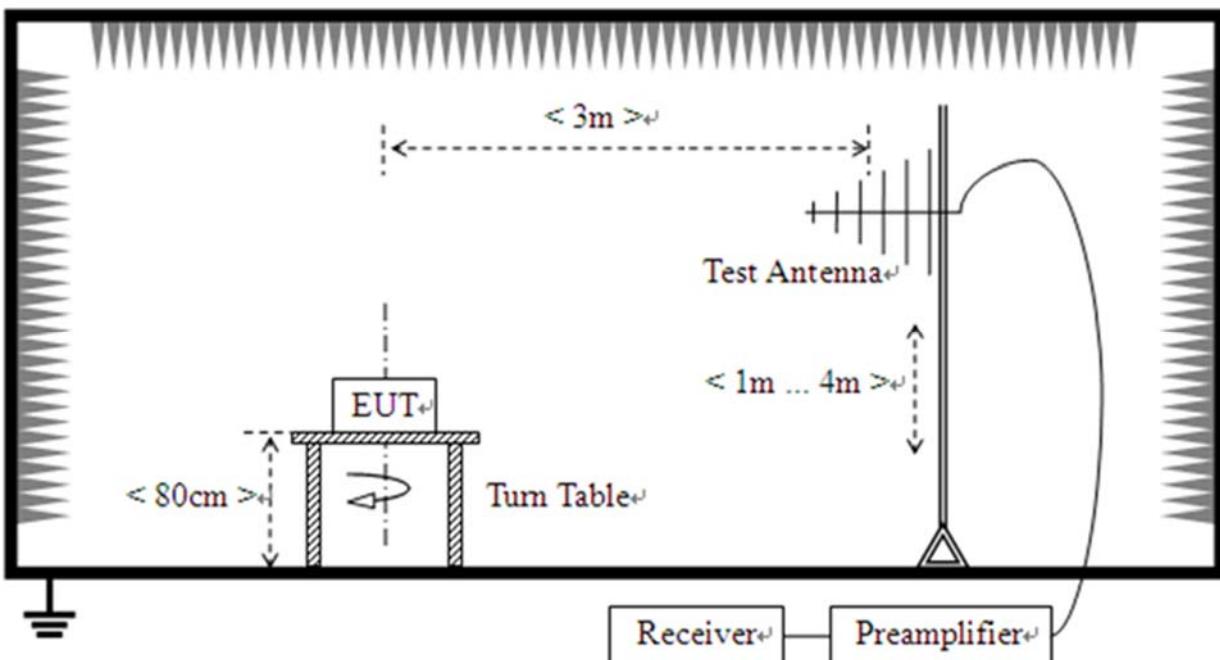
b) In the emission tables above, the tighter limit applies at the band edges.

### 2.3.2. Test Setup

1) For radiated emissions below 30MHz



2) For radiated emissions from 30MHz to 1GHz



The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating



Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

For the test Antenna:

In the frequency range of 9 kHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) was used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

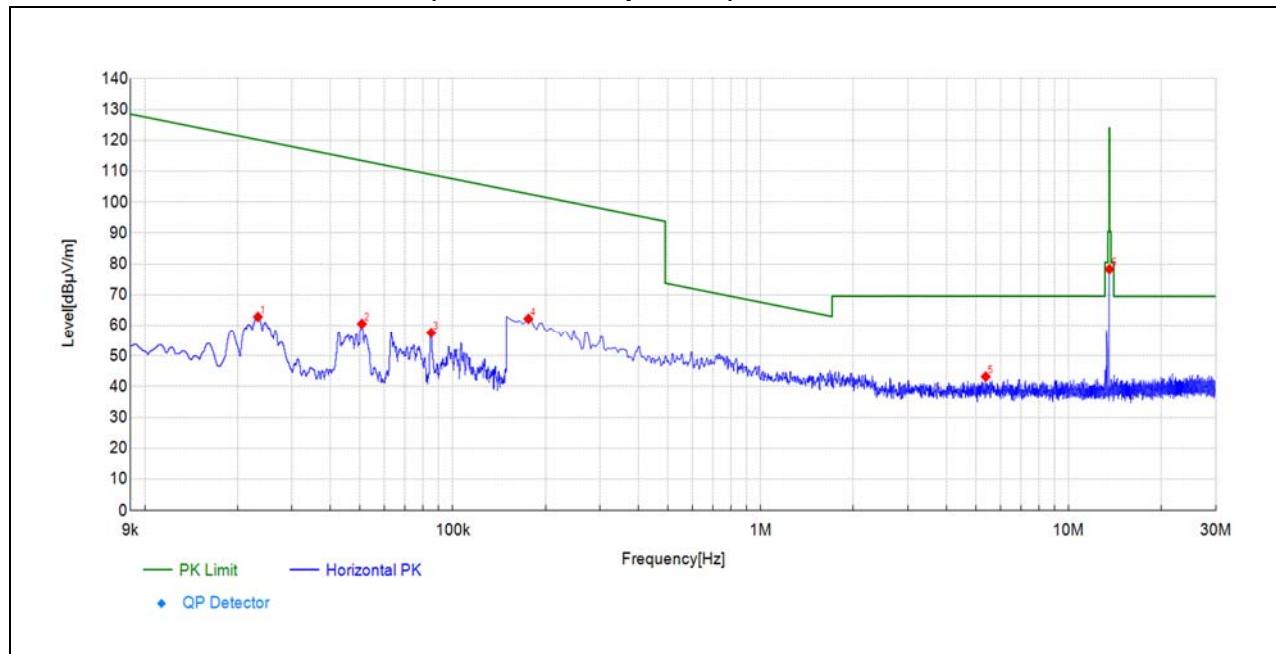
For measurements below 30MHz, the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9kHz-90 kHz, 110kHz-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector. For measurements frequency range from 0.009MHz to 0.15MHz, the resolution bandwidth is set to 200Hz. For measurements frequency range from 0.15MHz to 30MHz the resolution bandwidth is set to 9kHz.

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 bandwidth is set to 3MHz for peak measurements and as applicable for average measurements.

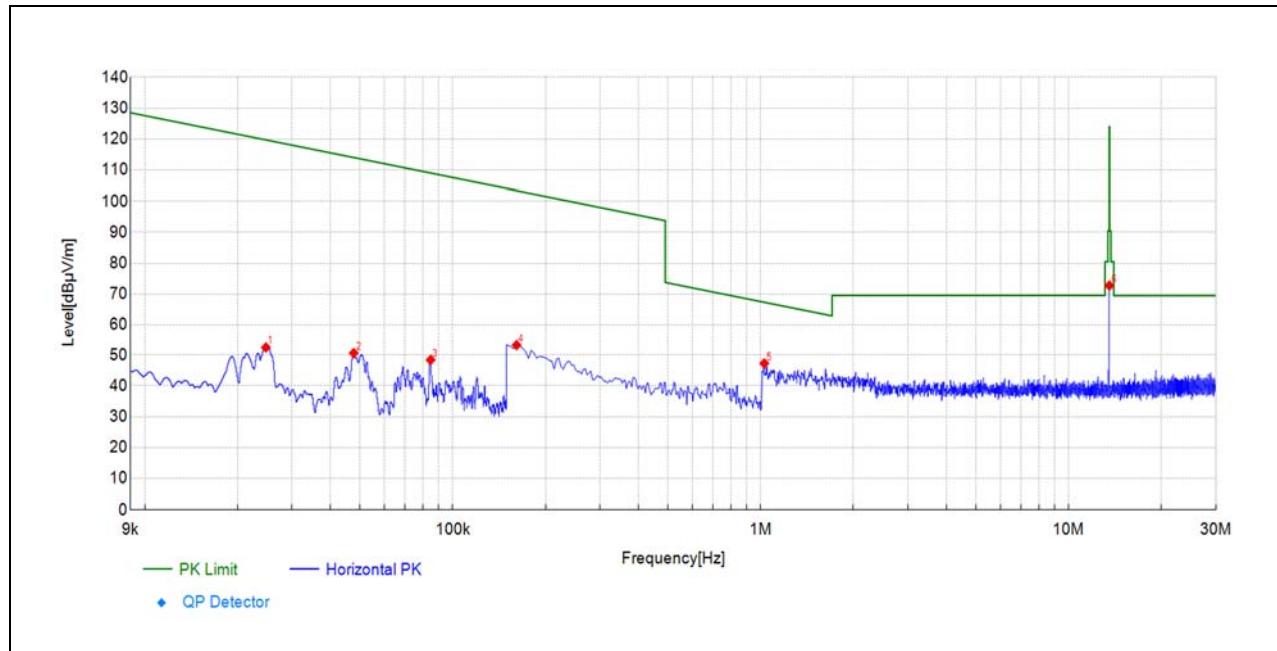
### 2.3.3. Test Result

#### A. Radiated Emission <30MHz (9kHz-30MHz, parallel)



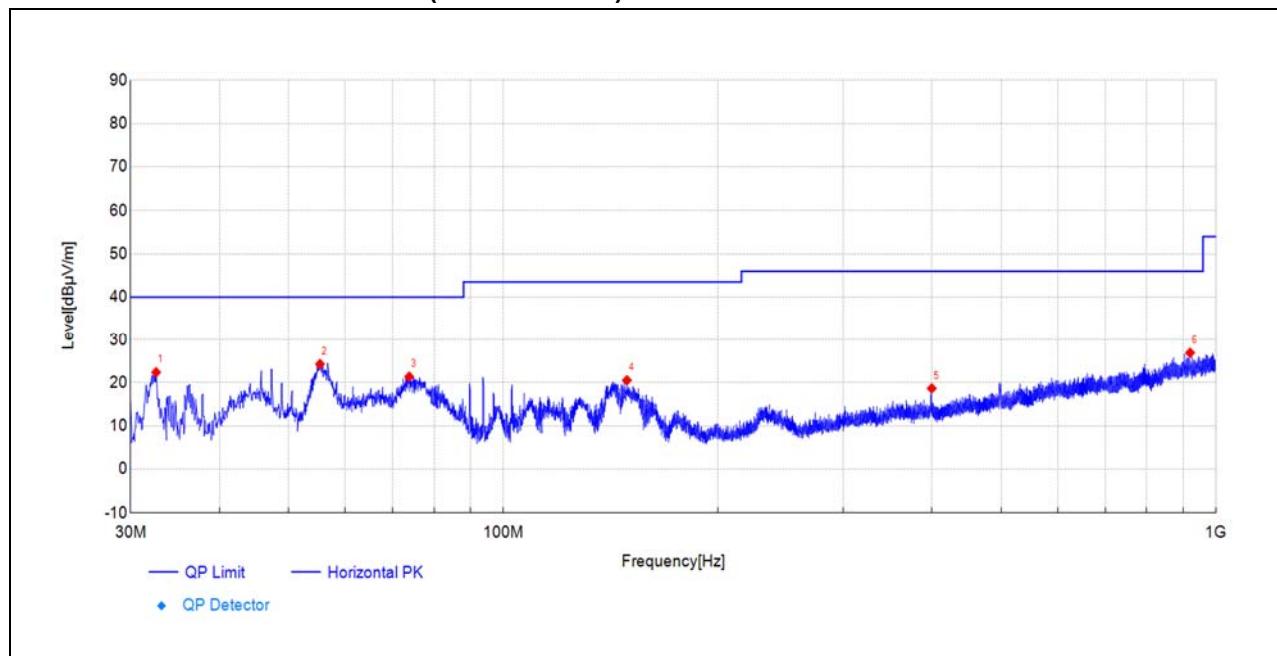
Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
0.02	43.3	62.85	19.540	127.49	64.64	100	100	PK	PASS
0.05	40.7	60.58	19.890	125.51	64.93	100	30	PK	PASS
0.09	37.9	57.56	19.620	123.02	65.46	100	20	PK	PASS
0.18	42.4	62.21	19.820	116.46	54.25	100	150	PK	PASS
5.38	22.9	43.20	20.290	69.54	26.34	100	270	PK	PASS
13.56	58.0	78.31	20.350	124.00	45.69	100	50	PK	PASS

## B.Radiated Emission &lt;30MHz (9kHz-30MHz, perpendicular)



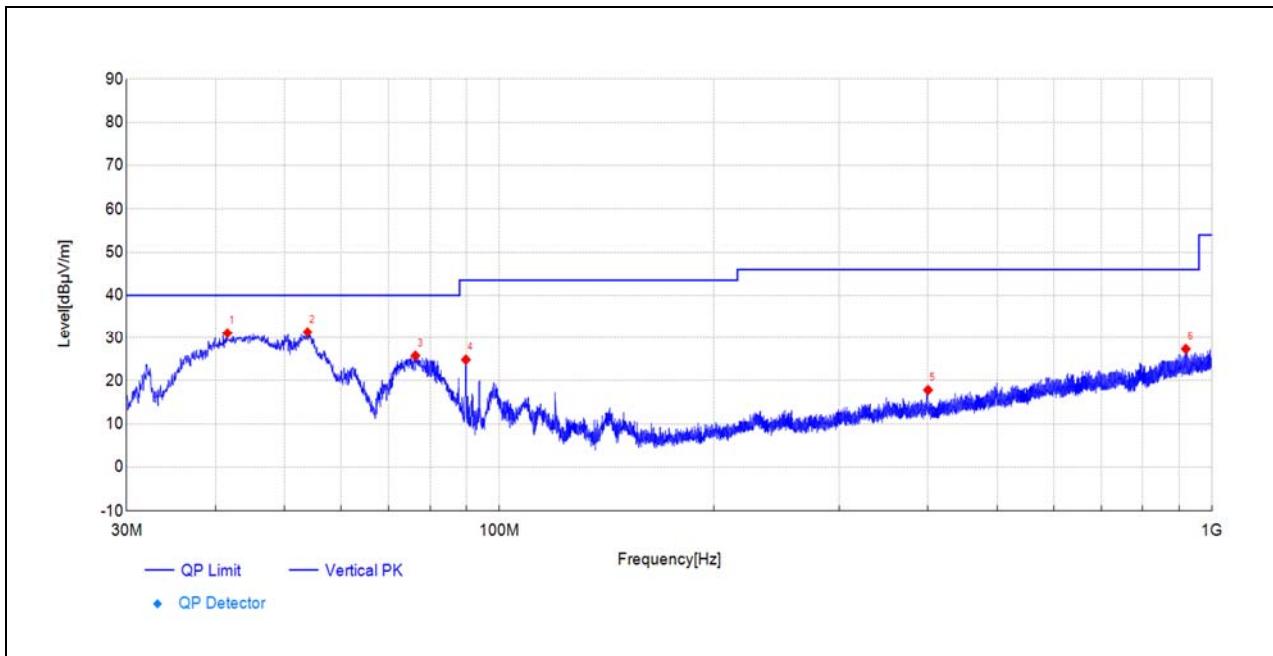
Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
0.02	32.9	52.43	19.550	127.38	74.95	100	360	PK	PASS
0.05	30.7	50.60	19.870	125.73	75.13	100	330	PK	PASS
0.08	28.8	48.39	19.630	123.05	74.66	100	30	PK	PASS
0.16	33.4	53.18	19.810	117.53	64.35	100	50	PK	PASS
1.03	27.2	47.26	20.030	69.01	21.75	100	180	PK	PASS
13.56	52.5	72.80	20.350	124.00	51.20	100	230	PK	PASS

## C.Radiated Emission &gt;30MHz (30MHz-1GHz)



(30MHz – 1GHz, Test Antenna Horizontal)

Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
32.57	52.9	22.39	-30.470	40.00	17.61	150	217	PK	PASS
55.32	52.2	24.30	-27.860	40.00	15.70	150	56	PK	PASS
73.80	53.9	21.37	-32.500	40.00	18.63	150	294	PK	PASS
149.17	52.3	20.54	-31.720	43.50	22.96	150	71	PK	PASS
399.49	41.0	18.66	-22.330	46.00	27.34	150	61	PK	PASS
920.55	38.5	26.91	-11.540	46.00	19.09	150	325	PK	PASS



(30MHz – 1GHz, Test Antenna Vertical)

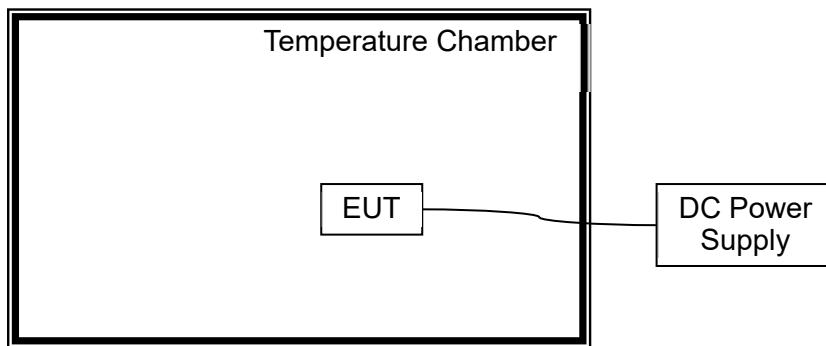
Fre. (MHz)	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Verdict
41.54	59.9	31.11	-28.810	40.00	8.89	150	309	PK	PASS
53.81	59.0	31.35	-27.600	40.00	8.65	150	9	PK	PASS
76.27	58.6	25.78	-32.790	40.00	14.22	150	359	PK	PASS
89.80	56.5	24.85	-31.690	43.50	18.65	150	70	PK	PASS
399.83	40.1	17.83	-22.280	46.00	28.17	150	9	PK	PASS
919.78	38.9	27.35	-11.500	46.00	18.65	150	101	PK	PASS

## 2.4. Frequency Tolerance

### 2.4.1. Test Requirement

According to FCC section 15.225, the devices operating in the 13.553~13.567 MHz shall maintain the carrier frequency within 0.01% of the operating frequency over the temperature variation of -20°C to +50°C using an environmental chamber. The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

### 2.4.2. Test Setup



The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT was measured by transmitter mode continuously.



### 2.4.3. Test Result

Operating Frequency: 13,560,000 Hz

Deference Voltage: 3.6V

Deviant Limit:  $\pm 0.01\%$

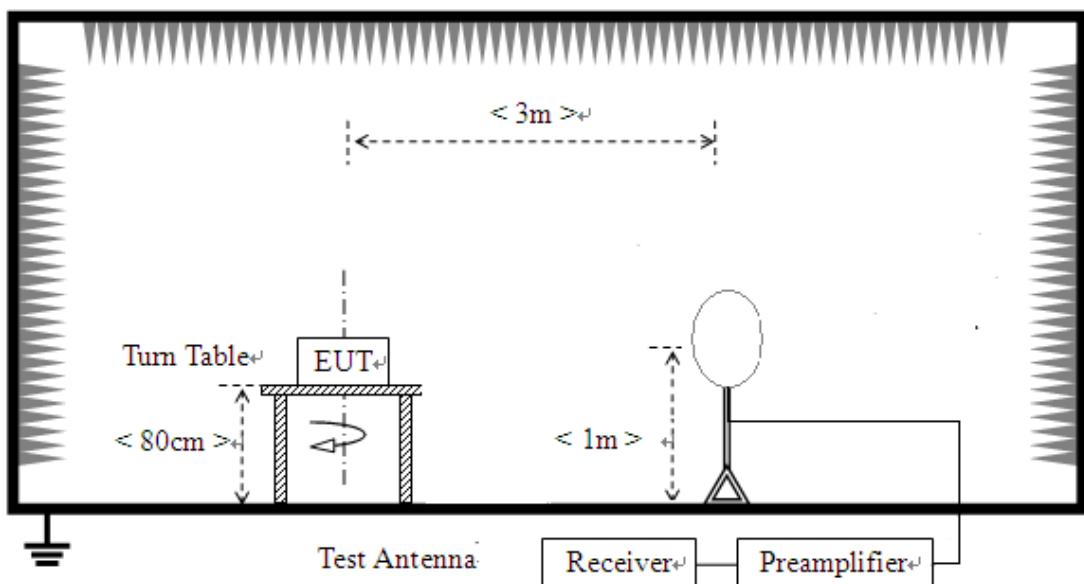
VOLTAGE (%)	Test Conditions		Fre. Dev. (Hz)	Deviation (%)	Verdict
	Power (VDC)	Temperature (°C)			
100	3.6	-20	279	0.00206	PASS
100		-10	273	0.00201	
100		0	256	0.00189	
100		10	245	0.00181	
100		20	266	0.00196	
100		25	260	0.00192	
100		30	218	0.00161	
100		40	274	0.00202	
100		50	279	0.00206	
85		20	280	0.00206	
115	4.2	20	256	0.00189	

## 2.5. 20 dB Bandwidth

### 2.5.1. Standard Applicable

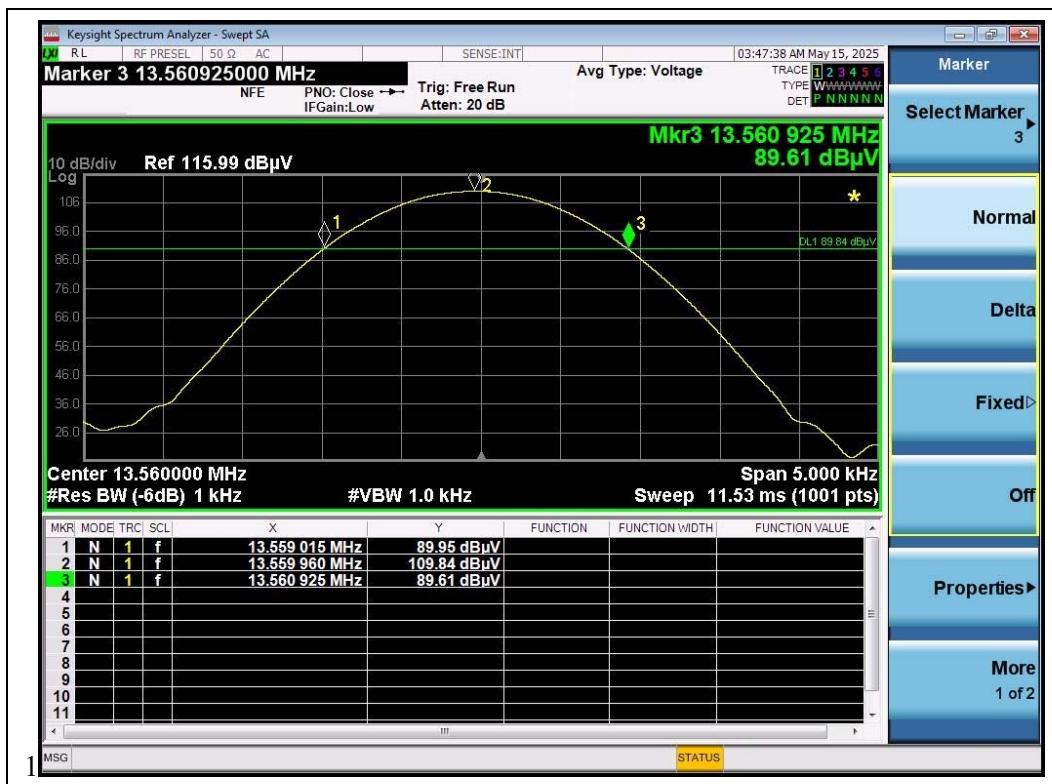
According to FCC section 15.215(c), the 20dB bandwidth should be contained within the frequency band designated in the rule section under which the EUT is operated, it was measured with a spectrum analyzer connected the EUT while the EUT is operating in transmission mode.

### 2.5.2. Test Setup



### 2.5.3. Test Result

Centre Frequency	Measurement		Limit		Verdict
	20 dB Bandwidth (kHz)	Frequency Range (MHz)	20dB Bandwidth (kHz)	Frequency Range(MHz)	
13.56MHz	0.96	13.55902 to 13.56093	14	13.553 to 13.567	PASS





## Annex A Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Test Items	Uncertainty
Radiated Emission	$\pm 3.1\text{dB}$
Conducted Emission	$\pm 1.8\text{dB}$
Bandwidth	$\pm 5\%$
Frequency Tolerance	$\pm 5\%$



## Annex B Testing Laboratory Information

### 1. Identification of the Responsible Testing Laboratory

<b>Laboratory Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd.
<b>Laboratory Address:</b>	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
<b>Telephone:</b>	+86 755 36698555
<b>Facsimile:</b>	+86 755 36698525

### 2. Identification of the Responsible Testing Location

<b>Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd.
<b>Address:</b>	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 Radiated Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Signal Analyzer	MY56060145	N9020A	Agilent	2024.05.30	2025.05.29
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2024.06.22	2025.06.21
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2024.06.03	2025.06.02
Anechoic Chamber	N/A	9m*6m*6m	CRT	2025.04.19	2028.04.18
DC Power Supply	1709D361010	IV3610	IVYTECH	2024.09.11	2025.09.19
Temperature Chamber	12108015	DTL-003S101	YOMA	2024.09.11	2025.09.19

##### 4.2 Conducted Emission Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY56400093	N9038A	KEYSIGHT	2025.01.06	2026.01.05
LISN	8127449	NSLK 8127	Schwarzbeck	2025.01.09	2026.01.18
Pulse Limiter (10dB)	VTSD 9561 F-B #206	VTSD 9561-F	Schwarzbeck	2024.05.30	2025.05.29
RF Coaxial Cable (DC-100MHz)	BNC	MRE04	Qualwave	2024.07.02	2025.07.01

##### 4.3 Test Software Utilized

Description	Manufacturer	Software Version
JS32-RE	Tonscend	5.0.0
TS+ -[JS32-CE]	Tonscend	V2.5.0.0
PMM Emission Suite	narda	Version 2.02

— END OF REPORT —