

Test Report

Verified code: 201153

Report No.: E202308027685-6

Customer: Nanjing CETC-Motor Co.,Ltd

Address: 2nd Floor, Building 3, Guorui, No.359 Middle Jiangdong Rd, Jianye District, Nanjing City, Jiangsu Province P.R.China

Sample Name: Remote Control Key

Sample Model: 11652820

Receive Sample Date: Aug.25,2023

Test Date: Oct.16,2023 ~ Nov.29,2023

Reference Document: 47 CFR Part 15 Subpart C Intentional Radiators
ANSI C63.10:2020

Test Result: Pass

Prepared by: Huang Lifang
Huang Lifang

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Jiang Tao

Approved by: Xiao Liang
Xiao Liang

GRG METROLOGY & TEST GROUP CO., LTD.

Issued Date: 2024-01-31

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E202308027685-6	Original Issue	2023-12-05

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1. TEST RESULT SUMMARY

Standard	Item	Limit / Severity	Result
47 CFR Part 15 Subpart C (15.231)	Conducted Emissions	§15.207	N/A ¹⁾
	Antenna Requirement	§15.203	PASS
	Transmission Time	§15.231(a) (2)	PASS
	20DB Bandwidth	§15.231 (c)	PASS
	Radiated Spurious Emission	§15.231(b)	PASS

Note:

¹⁾: The EUT is power by battery, the conducted emissions is not applicant.

²⁾: The EUT antenna is PCB antenna. Max antenna gain is -10dBi .which accordance 15.203.is considered sufficient to comply with the provisions of this section.

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2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name: Nanjing CETC-Motor Co.,Ltd
Address: 2nd Floor, Building 3, Guorui, No.359 Middle Jiangdong Rd, Jianye District, Nanjing City, Jiangsu Province P.R.China

2.2 MANUFACTURER

Name: Nanjing CETC-Motor Co.,Ltd
Address: 2nd Floor, Building 3, Guorui, No.359 Middle Jiangdong Rd, Jianye District, Nanjing City, Jiangsu Province P.R.China

2.3 FACTORY

Name: Suzhou Ouwei Intelligent car Technology Co.,LTD
Address: No.3 Building, No.233 Kangyang Road, Huangdai Town, Xiaocheng District, 215143 Suzhou City, Jiangsu Province, China

2.4 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: Remote Control Key
Model No.: 11652820
Adding Model: /
Model Differences: /
Trade Name: /
FCC ID: 2BD9I-11652820
Power Supply: DC 3V power supplied by battery

Battery Specification: Model: CR2032
Nominal Voltage: 3Vdc
Frequency Range: 433.369MHz, 433.92MHz
Max Antenna gain: PCB antenna, -10dBi(Max)
Type of Modulation: FSK
Temperature Range: -40℃~80℃
Hardware Version: 1.01
Software Version: 1.0

Sample submitting way: ☒ Provided by customer ☐ Sampling

Sample No: E202308027685-0002, E202308027685-0003

Note: The basic description of the EUT is provided by the applicant. This report is made Solely on the basis of such data and/or information. We accept no responsibility for the authenticity and completeness of the above data and information and the validity of the results and/or conclusions.

2.5 TEST MODE

Mode No.	Description of the modes
Mode 1	FSK 433.369MHz Transmitting
Mode 2	FSK 433.92MHz Transmitting

2.6 LOCAL SUPPORTIVE

Name of Equipment	Manufacturer	Model	Serial Number	Note
/	/	/	/	/

No.	Cable Type	Qty.	Shielded Type	Ferrite Core(Qty.)	Length
/	/	/	/	/	/

2.7 CONFIGURATION OF SYSTEM UNDER TEST

EUT

2.8 TEST SOFTWARE:

Software version	Test level
/	/

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3. LABORATORY AND ACCREDITATIONS

3.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

Add.: No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China.

P.C.: 518110

Tel : 0755-61180008

Fax: 0755-61180008

3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA A2LA(Certificate #2861.01)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada ISED (Company Number: 24897, CAB identifier:CN0069)

USA FCC (Registration Number: 759402, Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site,
<http://www.grgtest.com>

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4. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement		Frequency	Uncertainty
Radiated Emission	Coplanar	9kHz~30MHz	4.4dB ¹⁾
	Coaxial	9kHz~30MHz	4.4dB ¹⁾
	Horizontal	30MHz~200MHz	4.6dB ¹⁾
		200MHz~1000MHz	4.8dB ¹⁾
		1GHz~6GHz	5.0dB ¹⁾
	Vertical	30MHz~200MHz	4.7dB ¹⁾
		200MHz~1000MHz	4.7dB ¹⁾
		1GHz~6GHz	5.1dB ¹⁾
Conduction Emission		150kHz~30MHz	3.3 dB ¹⁾

Measurement	Uncertainty
RF frequency	6.0×10^{-6}
RF power conducted	0.78 dB
Occupied channel bandwidth	0.40 dB
Unwanted emission, conducted	0.68 dB
Humidity	6.0 %
Temperature	2.0°C

This uncertainty represents an expanded uncertainty factor of $k=2$.

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5. LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Radiated Spurious Emission & 20DB Bandwidth				
Test Receiver	R&S	ESR26	101758	2024-09-22
Loop Antenna	schwarzbeck	FMZB 1513-60	1513-60-56	2024-07-15
Bi-log Antenna	schwarzbeck	VULB 9160	VULB9160-3402	2024-09-24
Preamplifier	SHIRONG ELECTRONIC	DLNA-30M1G-G 41	20200928003	2023-12-19
Horn Antenna	Schwarzbeck	BBHA 9120D	02143	2024-09-23
Amplifier	Tonscend	TAP01018048	AP20E8060075	2024-04-11
Amplifier	SHIRONG ELECTRONIC	DLNA-1G18G-G 40	20200928005	2024-08-17
Test S/W	Tonscend	JS32-RE		
Transmission Time				
Spectrum Analyzer	R&S	FSV30	104381	2024-10-13

Note: The calibration interval of the above test instruments is 12 months.

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6. RADIATED SPURIOUS EMISSIONS

6.1 LIMITS

§15.231(b) In addition to the provisions of §15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emission (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	¹ 1,250 to 3,750	¹ 125 to 375
174-260	3,750	375
260-470	¹ 3,750 to 12,500	¹ 375 to 1,250
Above 470	12,500	1,250

1. ** linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = $56.81818 \cdot F - 6136.3636$; for the band 260-470 MHz, uV/m at 3 meters = $41.6667 \cdot F - 7083.3333$. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

§15.231(b)(3) The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in §15.209, whichever limit permits a higher field strength.

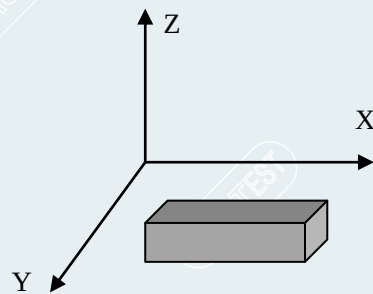
Frequency (MHz)	Quasi-peak(μ V/m)	Measurement distance(m)	Quasi-peak(dB μ V/m)@distance 3m
0.009-0.490	$2400/F(\text{kHz})$	300	128.5~93.8
0.490-1.705	$24000/F(\text{kHz})$	30	73.8~63
1.705-30.0	30	30	69.5
30 ~ 88	100	3	40
88~216	150	3	43.5
216 ~ 960	200	3	46
Above 960	500	3	54

NOTE: (1) The lower limit shall apply at the transition frequencies.

----- The following blanks -----

6.2 TEST PROCEDURES

- 1) The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 3) Height of receiving antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 4) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 5) If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- 6) The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.



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6.3 TEST SETUP

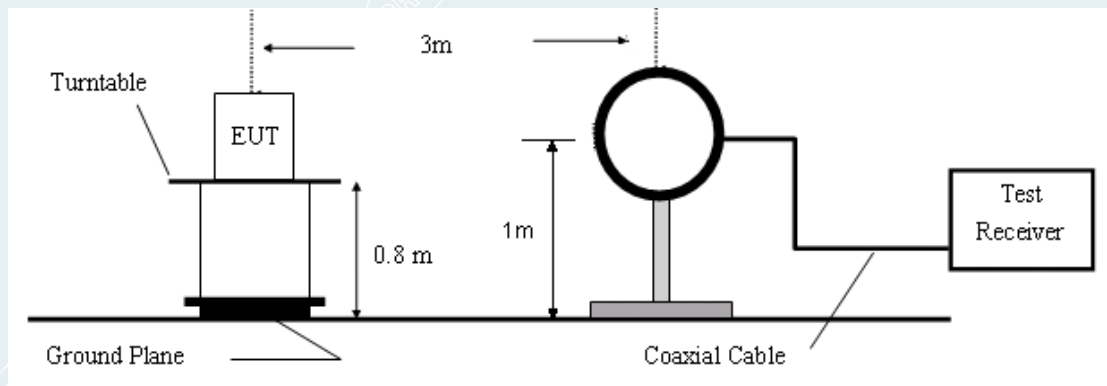


Figure 1. 9kHz to 30MHz radiated emissions test configuration

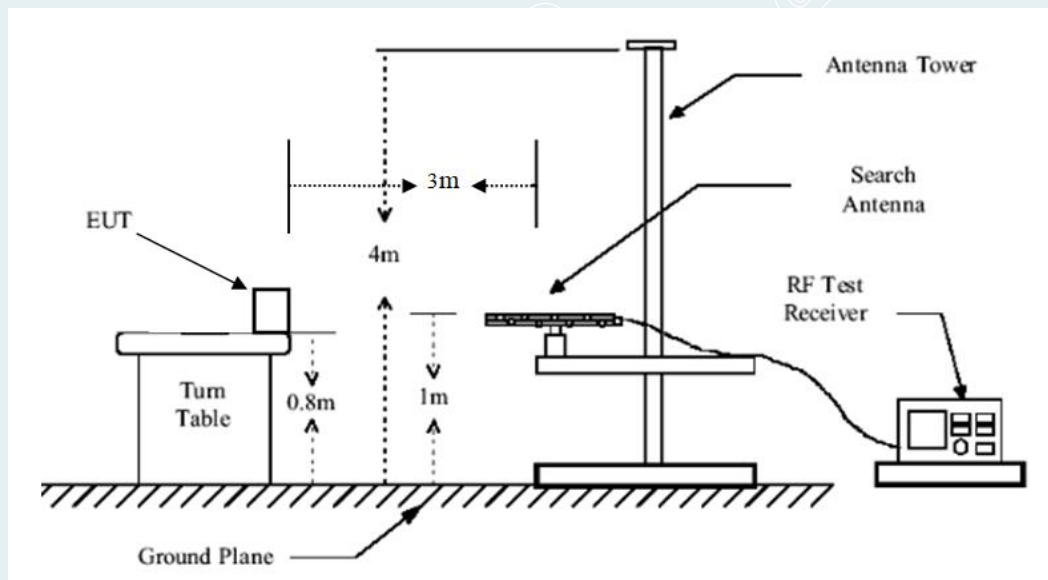


Figure 2. 30MHz to 1GHz radiated emissions test configuration

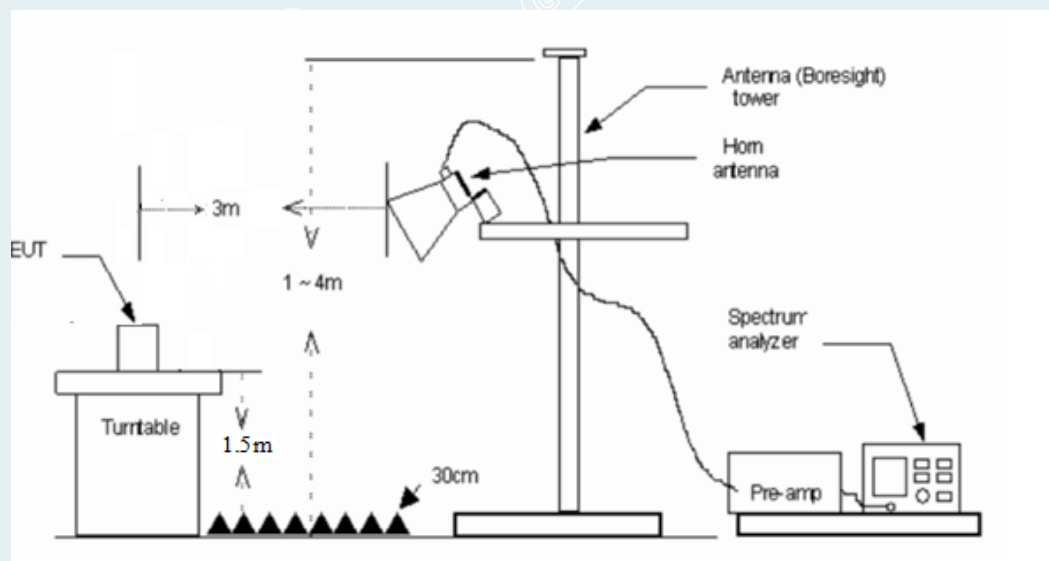


Figure 3. Above 1GHz radiated emissions test configuration

6.4 DATA SAMPLE**30MHz to 1GHz**

Suspected Data List										
NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
xxxx	xxxx	66.85	31.09	-35.76	40.00	8.91	PK	200	351	Horizontal

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Reading [dB μ V/m]	Level [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
xxxx	xxxx	-31.57	71.28	39.71	46.00	6.29	100	196	Horizontal

Frequency (MHz)

= Emission frequency in MHz

Reading (dB μ V/m)

= Uncorrected Analyzer / Receiver reading

Factor (dB)

= Antenna factor + Cable loss – Amplifier gain

Level (dB μ V/m)= Reading (dB μ V/m) + Factor (dB)Limit (dB μ V/m)

= Limit stated in standard

Margin (dB)

= Limit (dB μ V/m) – Level (dB μ V/m)

Polarity

= Antenna polarization

Peak

= Peak Reading

QP

= Quasi-peak Reading

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1GHz to 6GHz

No.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Remark
xxx	xxxx	78.01	55.30	-22.71	74.00	18.70	100	50	Horizontal	Peak
xxx	xxxx	66.37	43.66	-22.71	54.00	10.34	100	50	Horizontal	AVG

Frequency (MHz)

= Emission frequency in MHz

Reading (dBuV/m)

= Uncorrected Analyzer / Receiver reading

Factor (dB)

= Antenna factor + Cable loss – Amplifier gain

Level for 1m (dBuV/m)

= Reading (dBuV/m) + Factor (dB)

Level for 3m (dBuV/m)

= Level for 1m (dBuV/m) + 20*log(1/3)

Limit (dBuV/m)

= Limit stated in standard

Margin (dB)

= Limit (dBuV/m) – Level (dBuV/m)

Polarity

= Antenna polarization

Peak

= Peak Reading

AVG

= Average Reading

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6.5 TEST RESULTS

Duty Cycle: 433.369MHz

Transmitting conditions:

Environment:

24.2°C/54%RH/101kPa

Power Source:

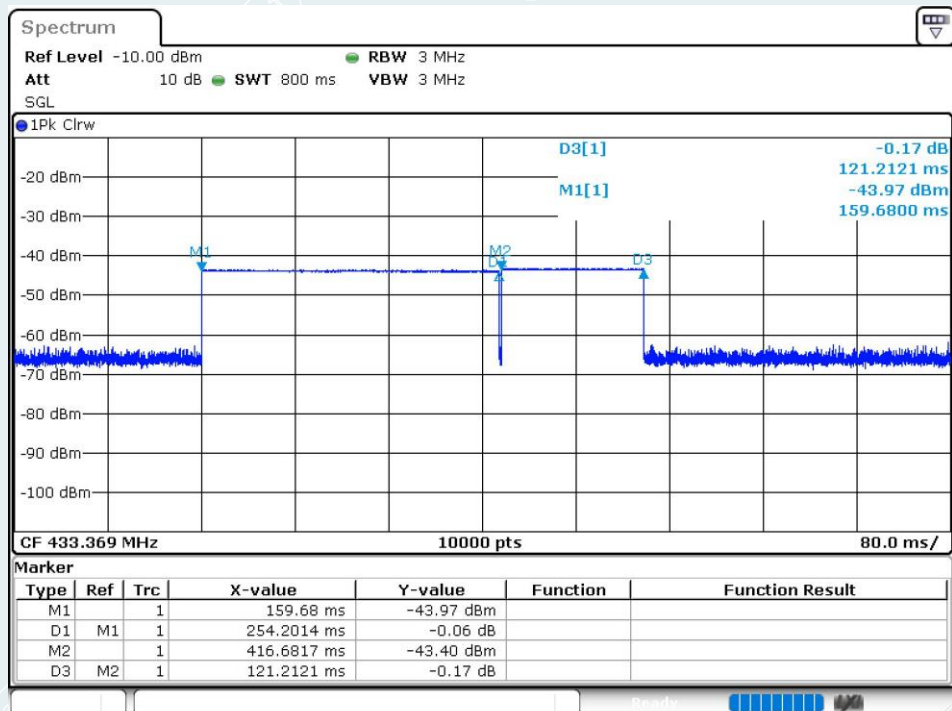
DC 3V

Test Date:

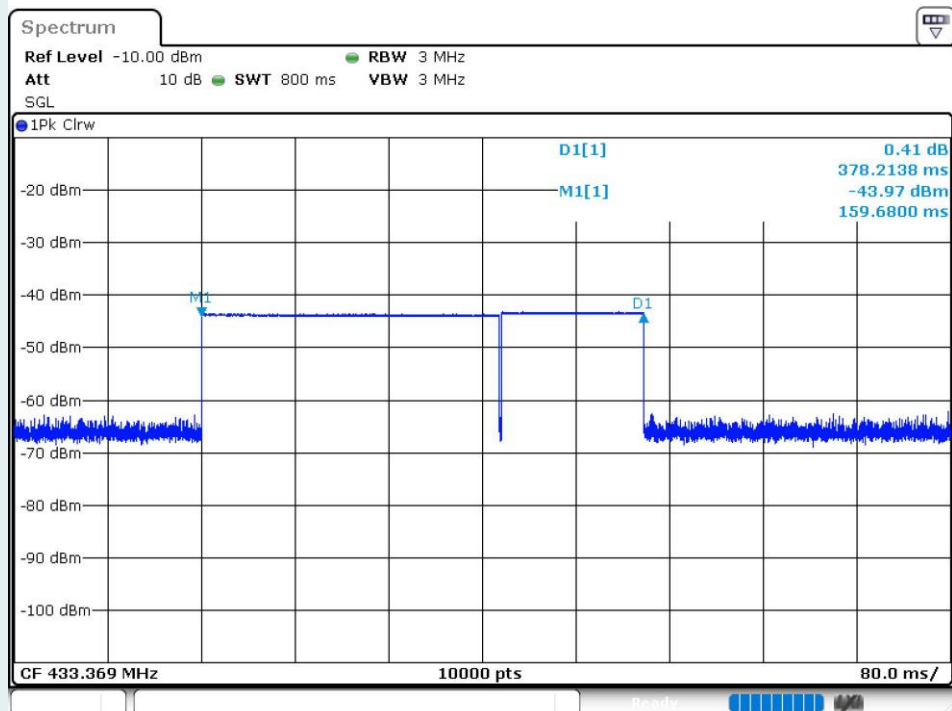
2023-11-29

Test By :

Huang Tianmei



Date: 29.NOV.2023 09:50:13



Date: 29.NOV.2023 09:58:37

The field strength of fundamental:

Environment: 23.5℃/53%RH/101kPa
 Power Source: DC 3V
 Test Date: 2023-11-29
 Test By : Zhang Zishan

TX / 433.369MHz

Frequency	Reading	Result	Correct	Limit	Margin	Height	Degree	Antenna Pole	Remark
(MHz)	(dBuV/m)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dB)	(cm)	(deg)	(V/H)	
433.369	84.94	61.84	-23.10	100.81	38.97	100	99	H	peak
433.369	68.88	45.79	-23.09	100.81	55.02	100	156	V	peak

Frequency	PK Result	Duty Cycle Correction	Result	Limit	Margin	Antenna Pole(V/H)	Remark
(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)		
433.369	61.84	0	61.84	80.81	18.97	H	AVG
433.369	45.79	0	45.79	80.81	35.02	V	AVG

Remark:

- 1) $\text{dBuV/m} = 20\text{Log}(\text{uV/m})$
- 2) $\text{AVG} = \text{Peak} + 20\text{Log}(\text{Duty Cycle})$
- 3) According to C63.10 clause 7.5 g), On time = $254.2014\text{ms} + 121.2121\text{ms} > 100\text{ms}$, so determine the duty cycle by dividing the total maximum "ON time" by 100 ms ($t_{\text{ON}}/100\text{ms}$), the Duty Cycle = 100%
- 4) Duty Cycle Correction Factor: $20\text{Log}(1) = 0$

----- The following blanks -----

Duty Cycle: 433.92MHz

Environment:

24.2°C/54%RH/101kPa

Power Source:

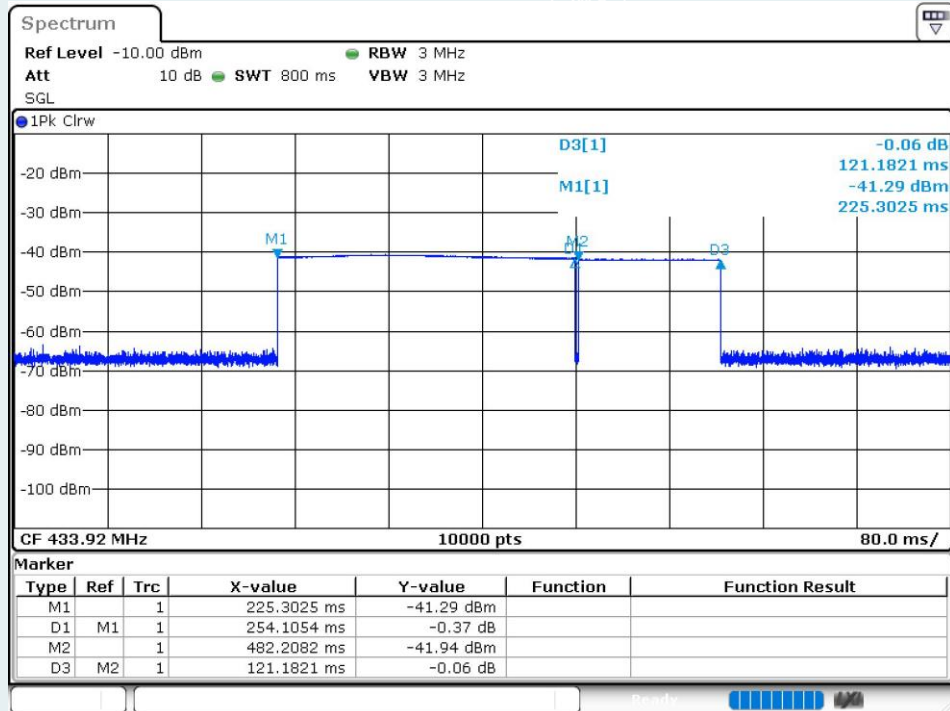
DC 3V

Test Date:

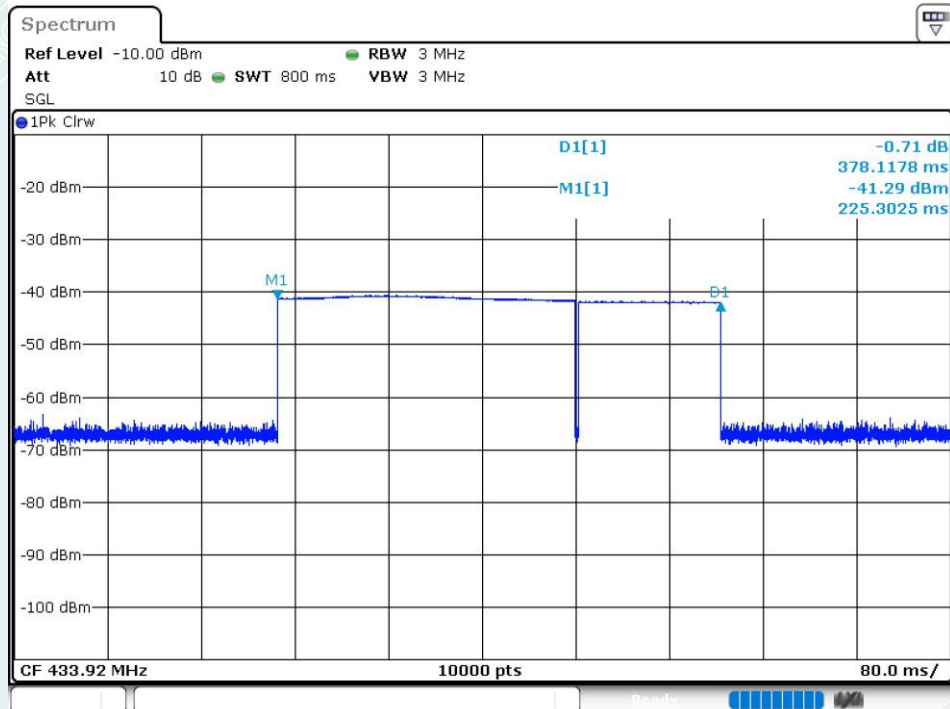
2023-11-29

Test By :

Huang Tianmei



Date: 29.NOV.2023 10:23:46



Date: 29.NOV.2023 10:25:14

The field strength of fundamental:

Environment:

23.5°C/53%RH/101kPa

Power Source:

DC 3V

Test Date:

2023-11-29

Test By :

Zhang Zishan

TX / 433.92MHz

Frequency	Reading	Result	Correct	Limit	Margin	Height	Degree	Antenna Pole	Remark
(MHz)	(dBuV/m)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dB)	(cm)	(deg)	(V/H)	
433.92	84.79	61.72	-23.07	100.83	39.11	100	124	H	peak
433.92	70.10	47.03	-23.07	100.83	53.80	100	157	V	peak

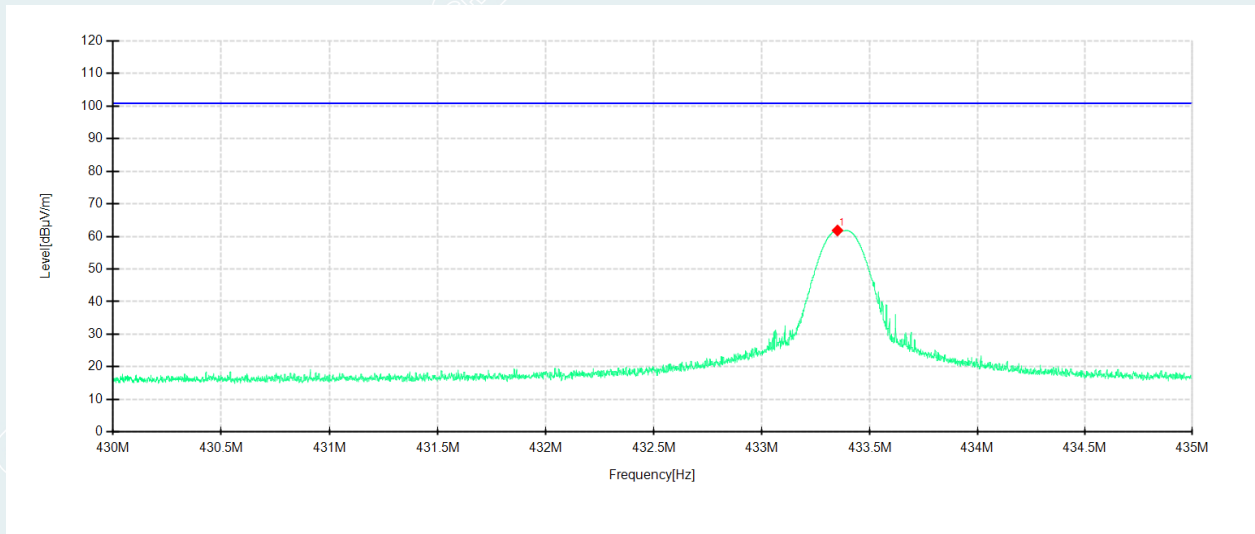
Frequency	PK Result	Duty Cycle Correction	Result	Limit	Margin	Antenna Pole(V/H)	Remark
(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)		
433.92	61.72	0	61.72	80.83	19.11	H	AVG
433.92	47.03	0	47.03	80.83	33.80	V	AVG

Remark:

- 1) $\text{dBuV/m} = 20\text{Log}(\text{uV/m})$
- 2) $\text{AVG} = \text{Peak} + 20\text{Log}(\text{Duty Cycle})$
- 3) According to C63.10 clause 7.5 g), On time = $254.1054\text{ms} + 121.1821\text{ms} > 100\text{ms}$, so determine the duty cycle by dividing the total maximum "ON time" by 100 ms ($t_{\text{ON}}/100\text{ms}$), the Duty Cycle = 100%
- 4) Duty Cycle Correction Factor: $20\text{Log}(1) = 0$

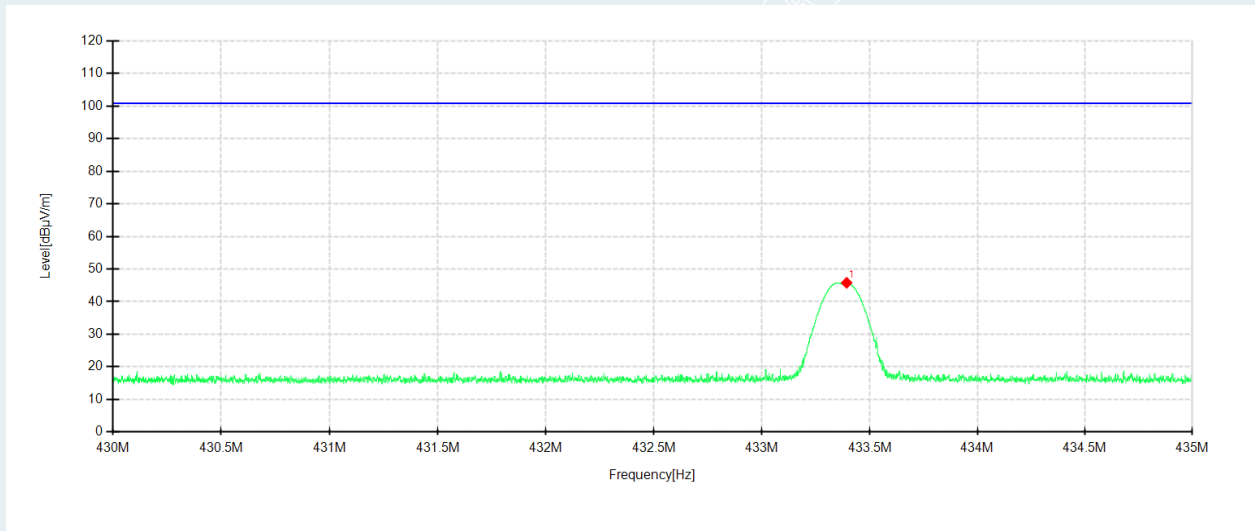
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433.369MHz



Suspected Data List

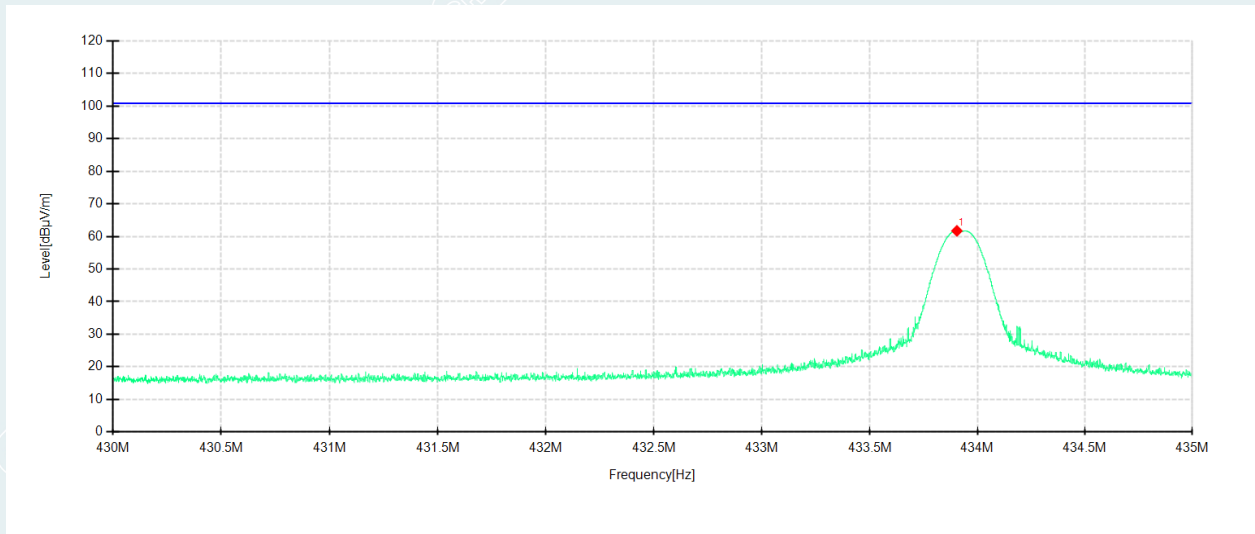
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	433.3504	84.94	61.84	-23.10	100.81	38.97	100	99	Horizontal



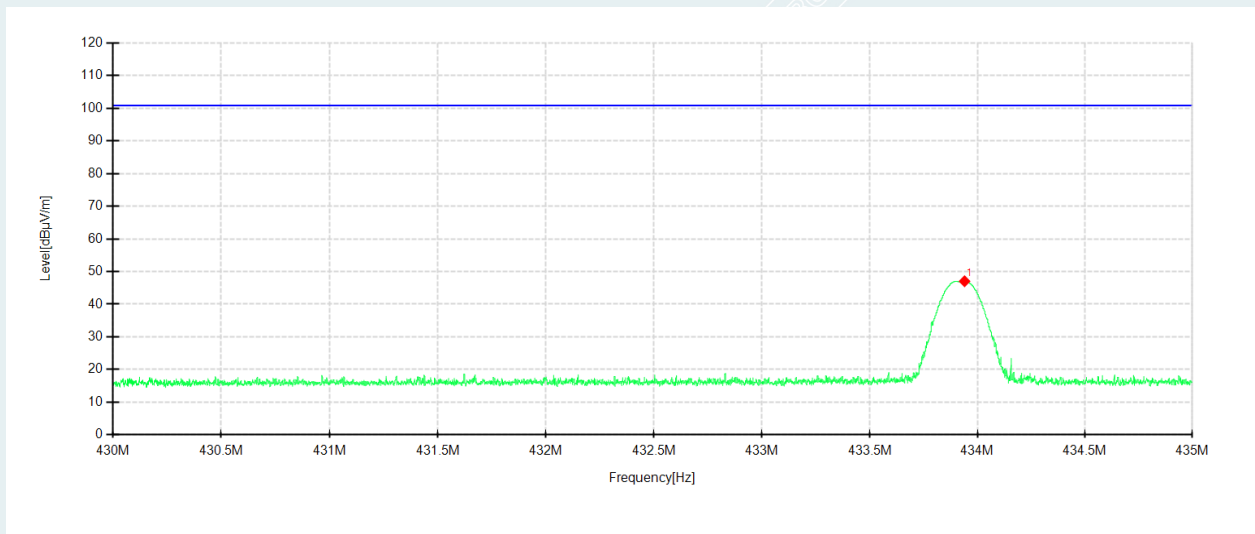
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	433.3929	68.88	45.79	-23.09	100.81	55.02	100	156	Vertical

433.92MHz

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	433.9049	84.79	61.72	-23.07	100.83	39.11	100	124	Horizontal

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	433.9405	70.10	47.03	-23.07	100.83	53.80	100	157	Vertical

Radiated Spurious Emission**For 9kHz to 30MHz**

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

For 30MHz – 1GHz

Environment:

23.5°C/53%RH/101kPa

Test Mode:

Mode 1

Power Source:

DC 3V

Test Date:

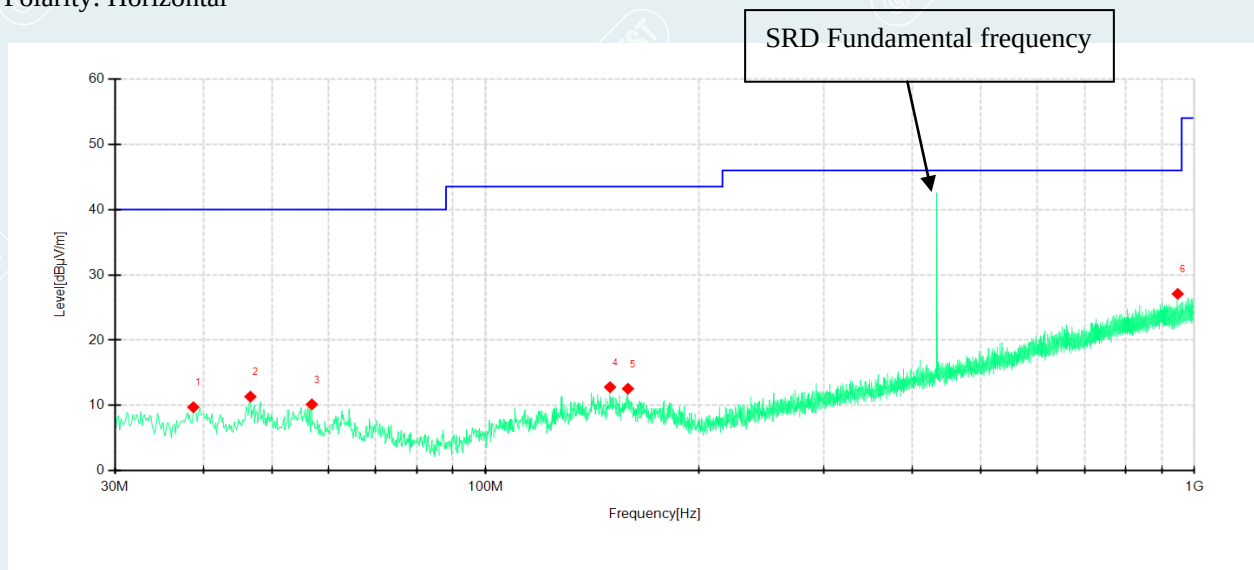
2023-10-16

Test By :

Zhang Zishan

433.369MHz

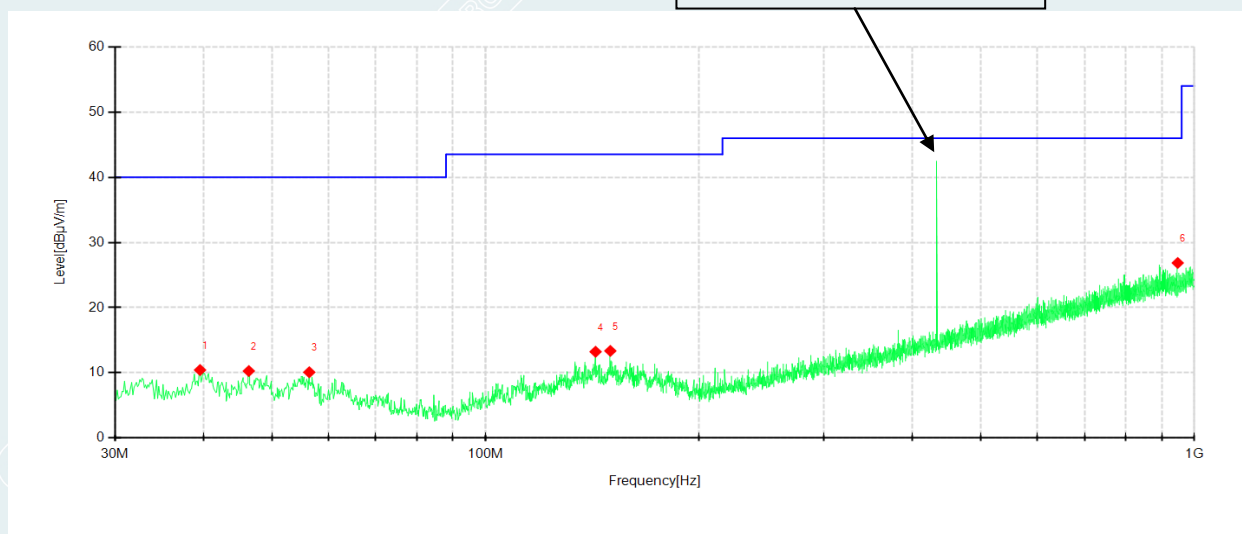
Polarity: Horizontal

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity	Verdict
1	38.7311	38.48	9.75	-28.73	40.00	30.25	PK	200	262	Horizontal	PASS
2	46.6133	39.93	11.36	-28.57	40.00	28.64	PK	100	72	Horizontal	PASS
3	56.9209	39.07	10.18	-28.89	40.00	29.82	PK	100	21	Horizontal	PASS
4	149.9312	40.66	12.82	-27.84	43.50	30.68	PK	100	243	Horizontal	PASS
5	158.9049	40.62	12.58	-28.04	43.50	30.92	PK	100	21	Horizontal	PASS
6	947.7347	42.51	27.10	-15.41	46.00	18.90	PK	200	339	Horizontal	PASS

Polarity: Vertical

SRD Fundamental frequency



Suspected Data List											
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity	Verdict
1	39.5799	39.12	10.44	-28.68	40.00	29.56	PK	200	332	Vertical	PASS
2	46.3708	38.85	10.28	-28.57	40.00	29.72	PK	100	117	Vertical	PASS
3	56.4358	38.96	10.10	-28.86	40.00	29.90	PK	100	339	Vertical	PASS
4	143.0191	41.27	13.24	-28.03	43.50	30.26	PK	100	194	Vertical	PASS
5	150.0525	41.21	13.37	-27.84	43.50	30.13	PK	200	202	Vertical	PASS
6	947.7347	42.27	26.86	-15.41	46.00	19.14	PK	100	144	Vertical	PASS

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Environment:

23.5°C/53%RH/101kPa

Test Mode:

Mode 2

Power Source:

DC 3V

Test Date:

2023-10-16

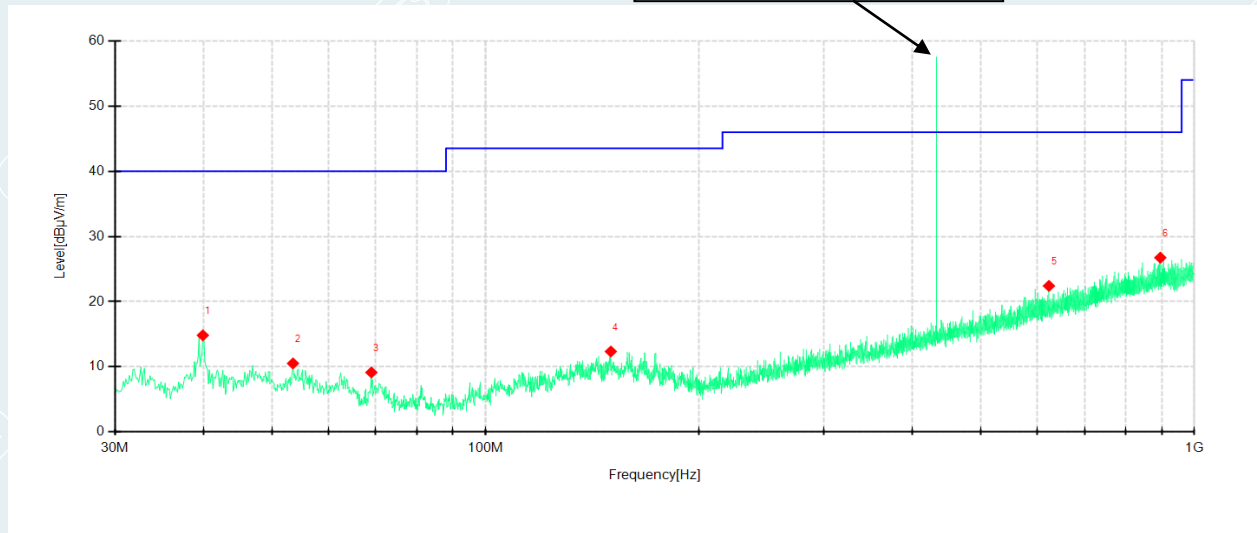
Test By :

Zhang Zishan

433.92MHz

Polarity: Horizontal

SRD Fundamental frequency



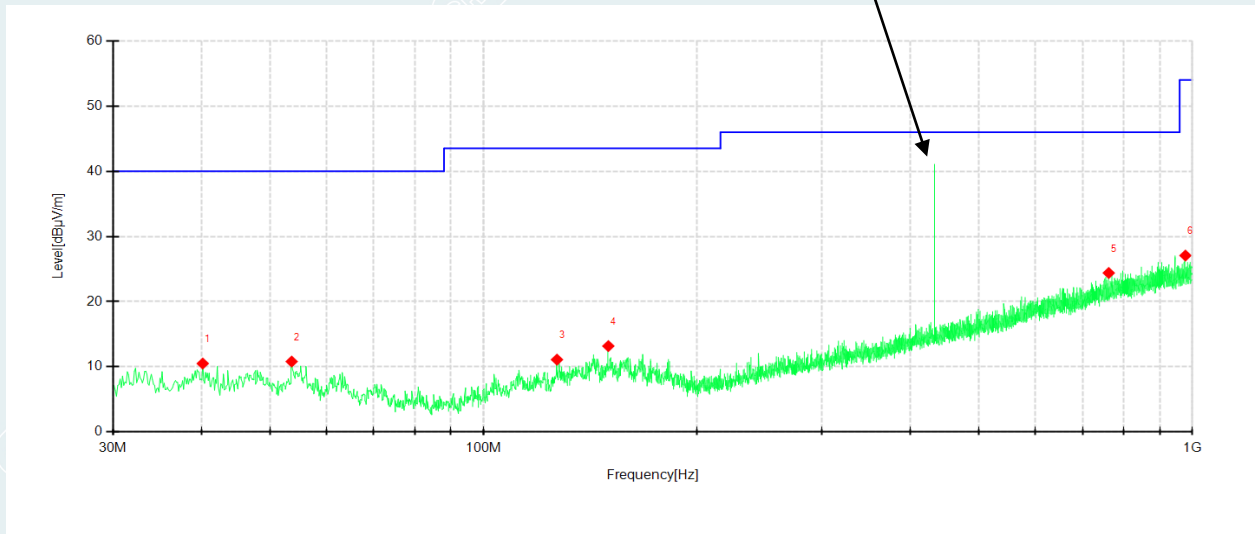
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity	Verdict
1	39.9437	43.50	14.84	-28.66	40.00	25.16	PK	100	190	Horizontal	PASS
2	53.5254	39.24	10.53	-28.71	40.00	29.47	PK	100	165	Horizontal	PASS
3	69.0474	39.88	9.15	-30.73	40.00	30.85	PK	100	59	Horizontal	PASS
4	150.2950	40.21	12.36	-27.85	43.50	31.14	PK	100	269	Horizontal	PASS
5	623.7142	41.22	22.42	-18.80	46.00	23.58	PK	200	41	Horizontal	PASS
6	895.5907	41.99	26.75	-15.24	46.00	19.25	PK	200	195	Horizontal	PASS

----- The following blanks -----

Polarity: Vertical

SRD Fundamental frequency

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity	Verdict
1	40.1863	39.17	10.51	-28.66	40.00	29.49	PK	200	332	Vertical	PASS
2	53.6467	39.53	10.82	-28.71	40.00	29.18	PK	100	51	Vertical	PASS
3	127.0121	40.37	11.11	-29.26	43.50	32.39	PK	200	282	Vertical	PASS
4	150.0525	41.03	13.19	-27.84	43.50	30.31	PK	100	104	Vertical	PASS
5	762.4416	41.11	24.40	-16.71	46.00	21.60	PK	100	248	Vertical	PASS
6	978.0510	41.63	27.07	-14.56	54.00	26.93	PK	100	130	Vertical	PASS

Remark:

- 1 No emission found between lowest internal used/generated frequency to 30MHz.
- 2 Radiated emissions measured in frequency range from 30MHz to 1GHz were made with an instrument using Peak detector mode. If the margin of the pre test results is greater than 6db, it meets the requirements of quasipeak or average values, and final testing is no longer required.
- 3 The IF bandwidth of Receiver between 30MHz to 1GHz was 120kHz.
- 4 Below 1GHz: factor = Antenna Factor + Cable Loss.
- 5 Remark: The fundamental frequency's limit is controlled to the standard of Radio frequency.

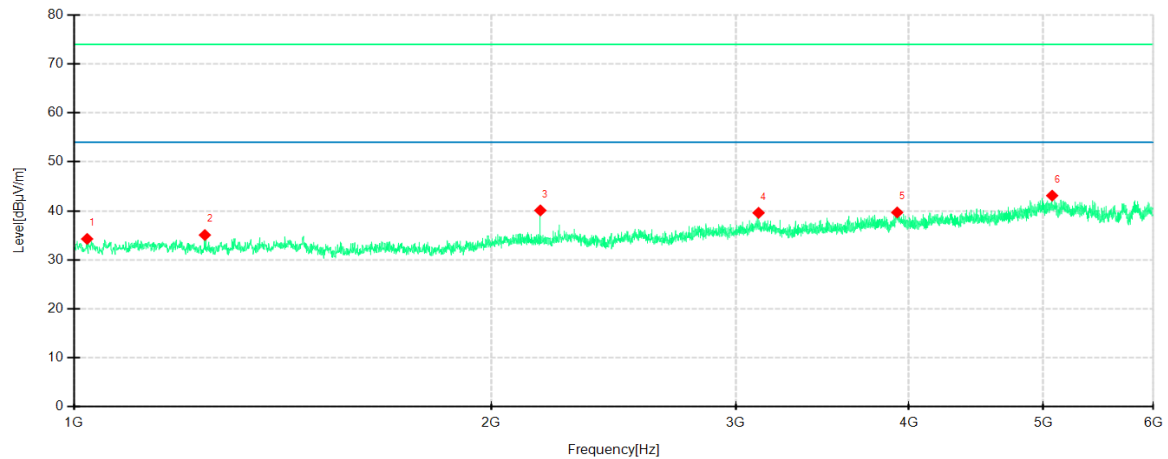
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For Emission above 1GHz:

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Environment: 23.5°C/53%RH/101kPa
 Test Mode: Mode 1
 Power Source: DC 3V
 Test Date: 2023-10-16
 Test By : Zhang Zishan

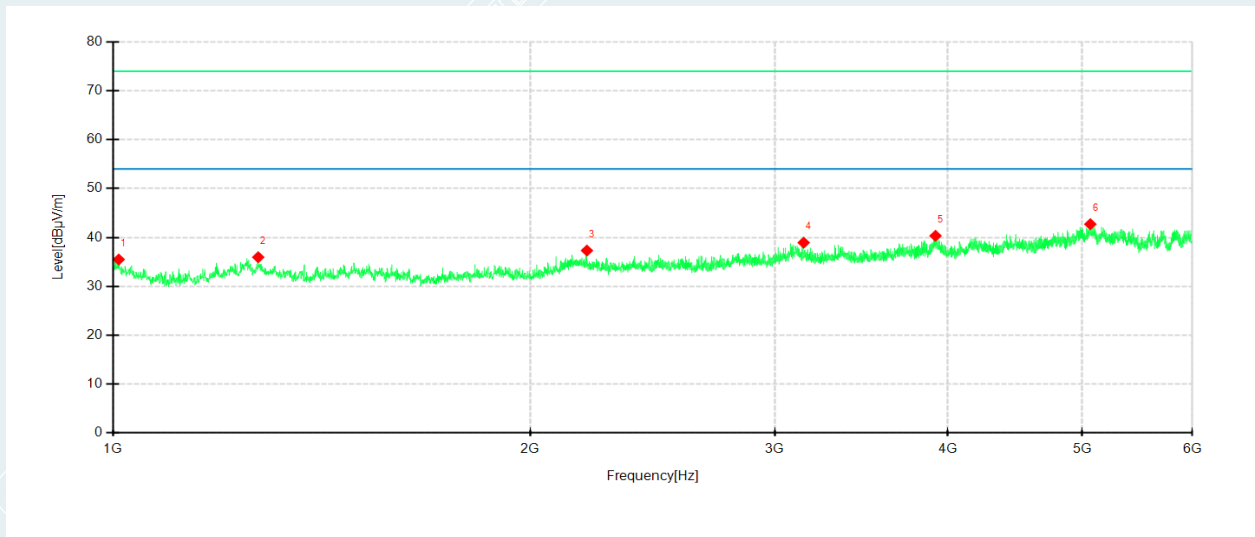
433.369MHz



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1022.5000	55.47	34.28	-21.19	74.00	39.72	100	268	Horizontal
2	1243.1250	55.91	35.07	-20.84	74.00	38.93	100	176	Horizontal
3	2169.3750	56.99	40.10	-16.89	74.00	33.90	100	216	Horizontal
4	3116.2500	52.12	39.60	-12.52	74.00	34.40	100	125	Horizontal
5	3922.5000	49.54	39.69	-9.85	74.00	34.31	100	318	Horizontal
6	5073.1250	46.63	43.12	-3.51	74.00	30.88	100	332	Horizontal

----- The following blanks -----

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1010.0000	55.53	35.50	-20.03	74.00	38.50	100	223	Vertical
2	1273.1250	55.37	35.96	-19.41	74.00	38.04	100	288	Vertical
3	2196.8750	53.64	37.33	-16.31	74.00	36.67	200	72	Vertical
4	3148.1250	51.58	38.94	-12.64	74.00	35.06	200	215	Vertical
5	3918.1250	49.90	40.34	-9.56	74.00	33.66	200	110	Vertical
6	5066.2500	46.13	42.72	-3.41	74.00	31.28	200	160	Vertical

----- The following blanks -----

Environment:

23.5°C/53%RH/101kPa

Test Mode:

Mode 2

Power Source:

DC 3V

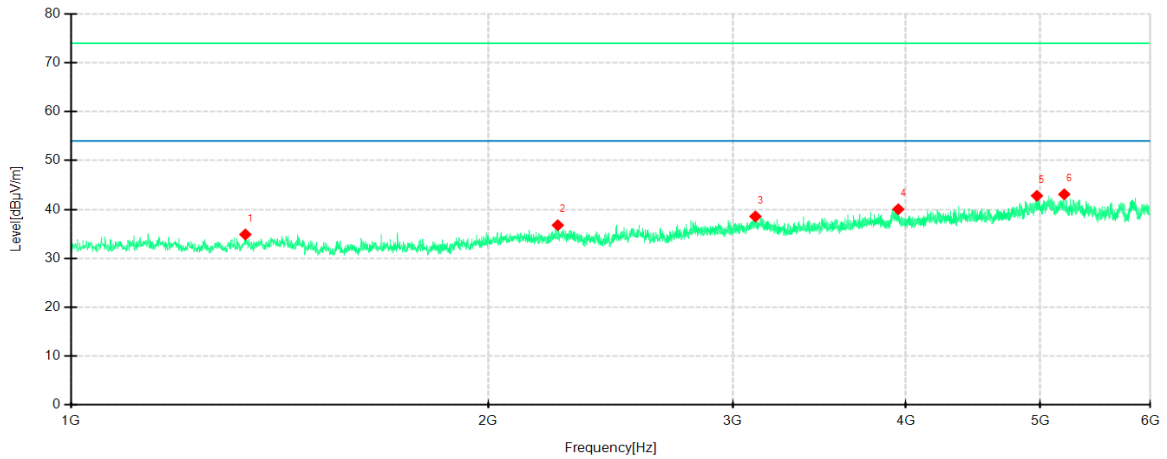
Test Date:

2023-10-16

Test By :

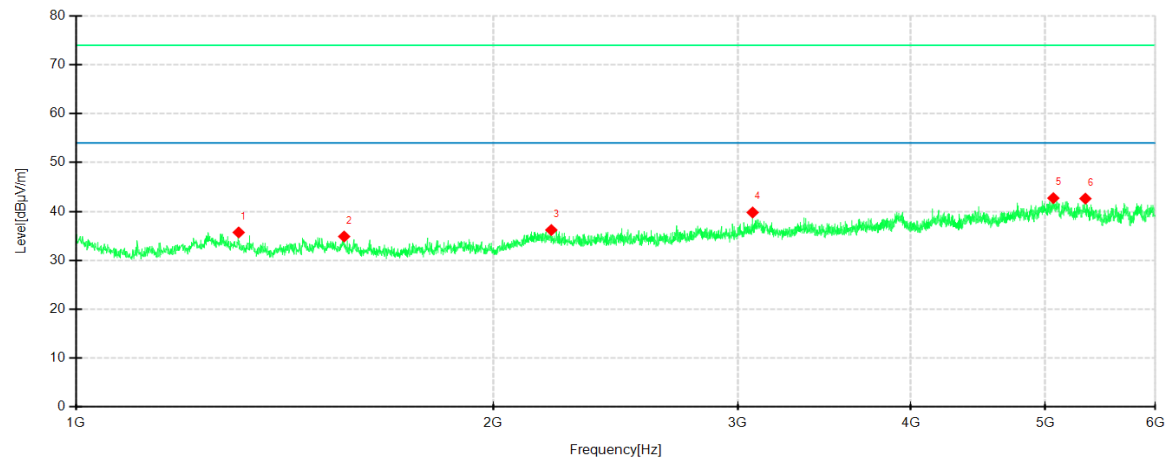
Zhang Zishan

433.92MHz

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1336.2500	55.16	34.88	-20.28	74.00	39.12	100	344	Horizontal
2	2244.3750	53.07	36.78	-16.29	74.00	37.22	200	249	Horizontal
3	3115.6250	51.10	38.57	-12.53	74.00	35.43	200	173	Horizontal
4	3949.3750	49.50	40.05	-9.45	74.00	33.95	200	236	Horizontal
5	4971.2500	47.26	42.80	-4.46	74.00	31.20	200	173	Horizontal
6	5201.8750	46.19	43.10	-3.09	74.00	30.90	200	106	Horizontal

----- The following blanks -----



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1310.6250	55.71	35.71	-20.00	74.00	38.29	100	196	Vertical
2	1561.2500	54.49	34.88	-19.61	74.00	39.12	200	203	Vertical
3	2201.8750	52.54	36.20	-16.34	74.00	37.80	100	210	Vertical
4	3075.6250	52.52	39.79	-12.73	74.00	34.21	200	72	Vertical
5	5066.2500	46.14	42.73	-3.41	74.00	31.27	200	296	Vertical
6	5343.1250	46.36	42.63	-3.73	74.00	31.37	200	243	Vertical

Note:

- 1 Radiated emissions measured in frequency range from 1GHz – 6GHz were made with an instrument using Peak/AV detector mode.
- 2 According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it's unnecessary to perform an average measurement.
- 3 The IF bandwidth of Receiver between above was 1MHz
- 4 Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain.

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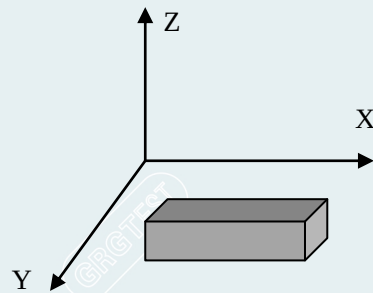
7. 20DB BANDWIDTH

7.1 LIMITS

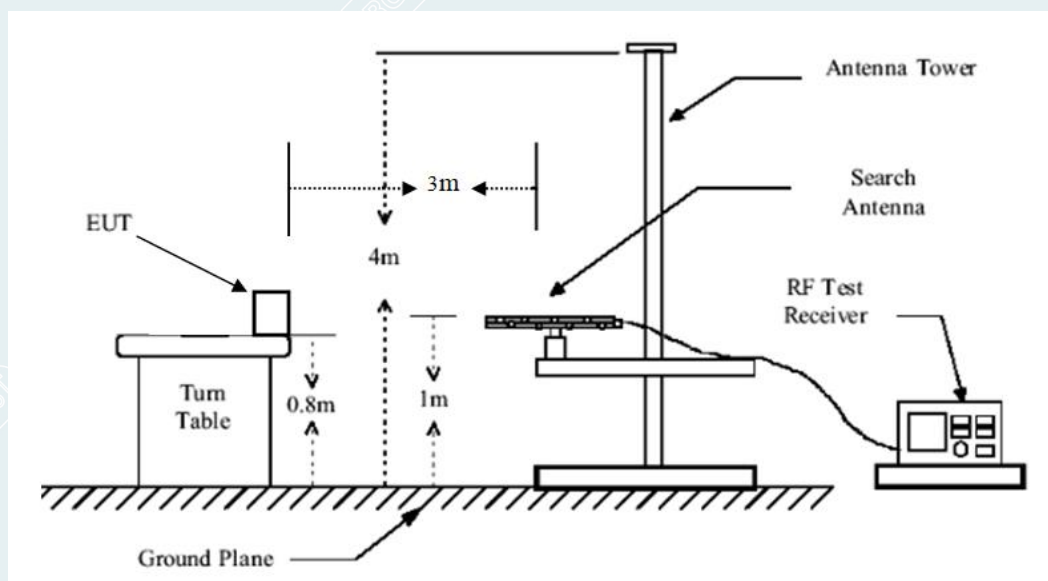
§15.231(c) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

7.2 TEST PROCEDURES

- 1) The EUT was placed on the top of a rotating table 1.5 meters (for above 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 3) Height of receiving antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 4) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 5) Set resolution bandwidth (RBW) = 1kHz. Set the video bandwidth (VBW) $\geq 3 \times$ RBW. Detector = Peak. Trace mode = max hold. Sweep = auto couple. Allow the trace to stabilize, record 20dB bandwidth value.
- 6) Repeat above procedures until all frequencies measured were complete.
- 7) The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.



7.3 TEST SETUP



----- The following blanks -----

7.4 TEST RESULTS

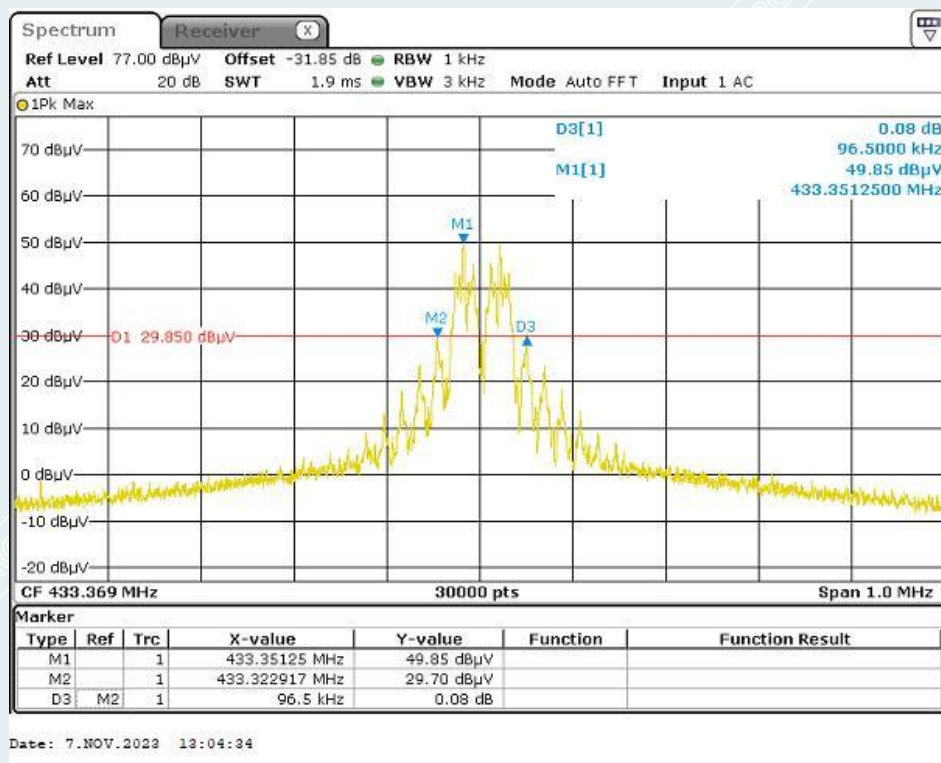
Environment: 23.5°C/53%RH/101kPa
 Power Source: DC 3V
 Test Date: 2023-11-07
 Test By : Zhang Zishan

The worst data of the Antenna Polarity was shown in this item.

Test mode: 433.369MHz

Frequency(MHz)	Bandwidth(kHz)	Limit(kHz)	Test Result
433.369	96.5	1083.4	PASS

Test Plot

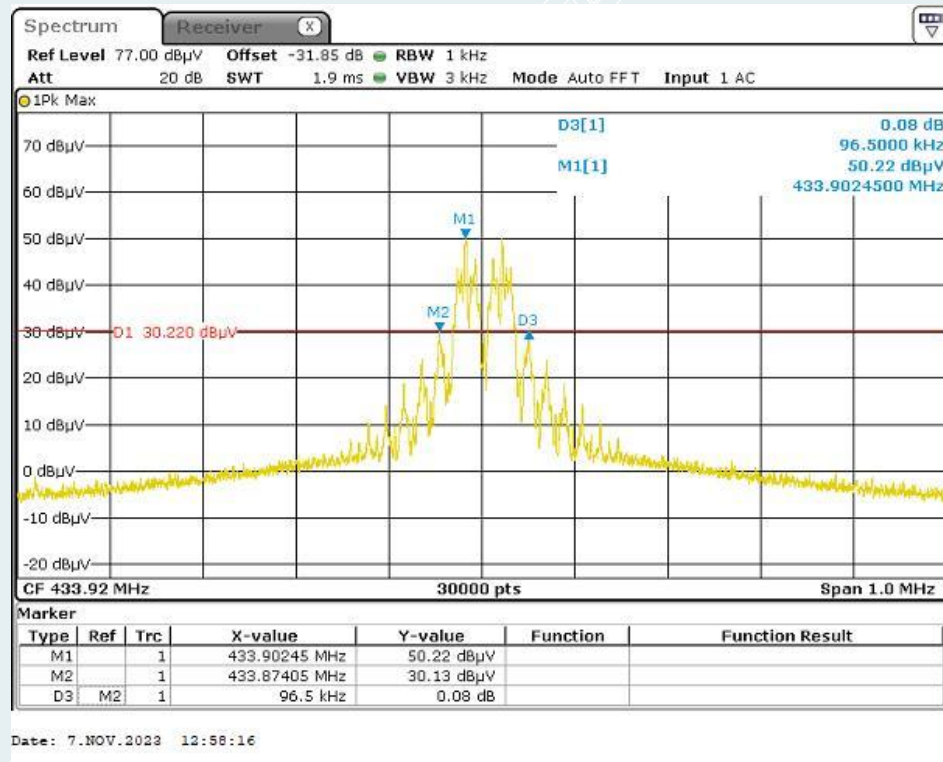


433.369MHz

----- The following blanks -----

Test mode: 433.92MHz

Frequency(MHz)	Bandwidth(kHz)	Limit(kHz)	Test Result
433.92	96.5	1084.8	PASS

Test Plot

433.92MHz

----- The following blanks -----

8. TRANSMISSION TIME

8.1 LIMITS

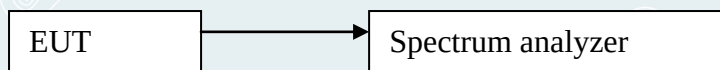
§15.231(a) for this periodic operation:

(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

8.2 TEST PROCEDURES

- 1) The spectrum analyzer resolution bandwidth that is $\leq$ EBW. So we test the Maximum Conducted Output Power ——Integrated band power method.
- 2) Set the analyzer span = 0Hz. RBW = 3MHz. Set VBW = 3MHz. Detector = Peak. Sweep = Adjust according to actual conditions.
- 3) Allow the trace to stabilize, record value.

8.3 TEST SETUP



8.4 TEST RESULTS

Environment:

24.2°C/54%RH/101kPa

Power Source:

DC 3V

Test Date:

2023-11-29

Test By :

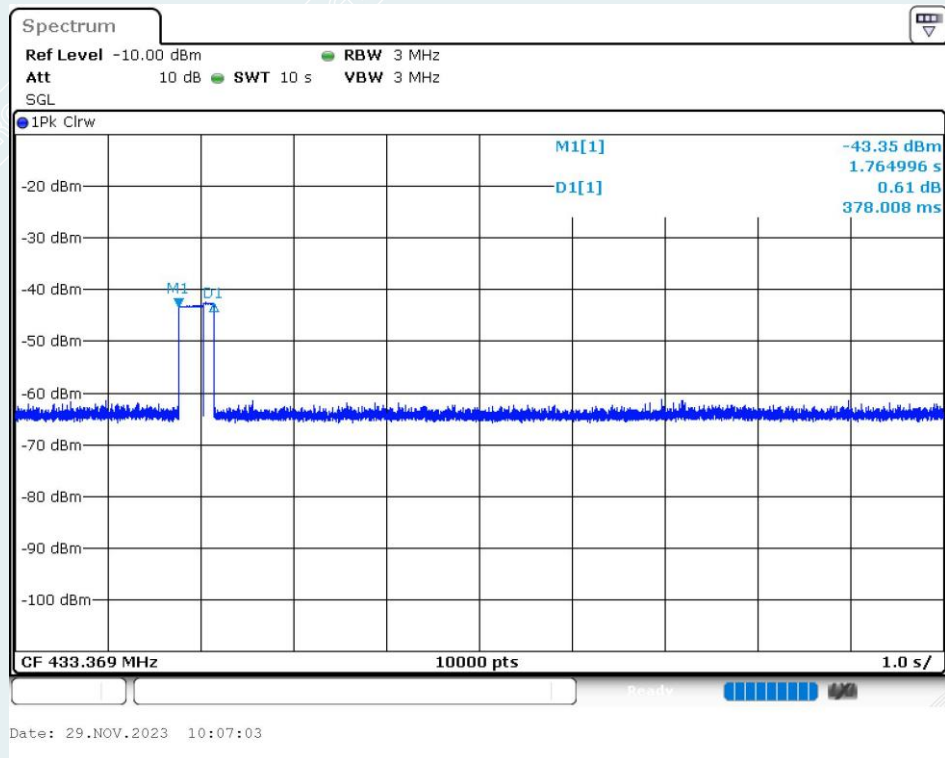
Huang Tianmei

433.369MHz

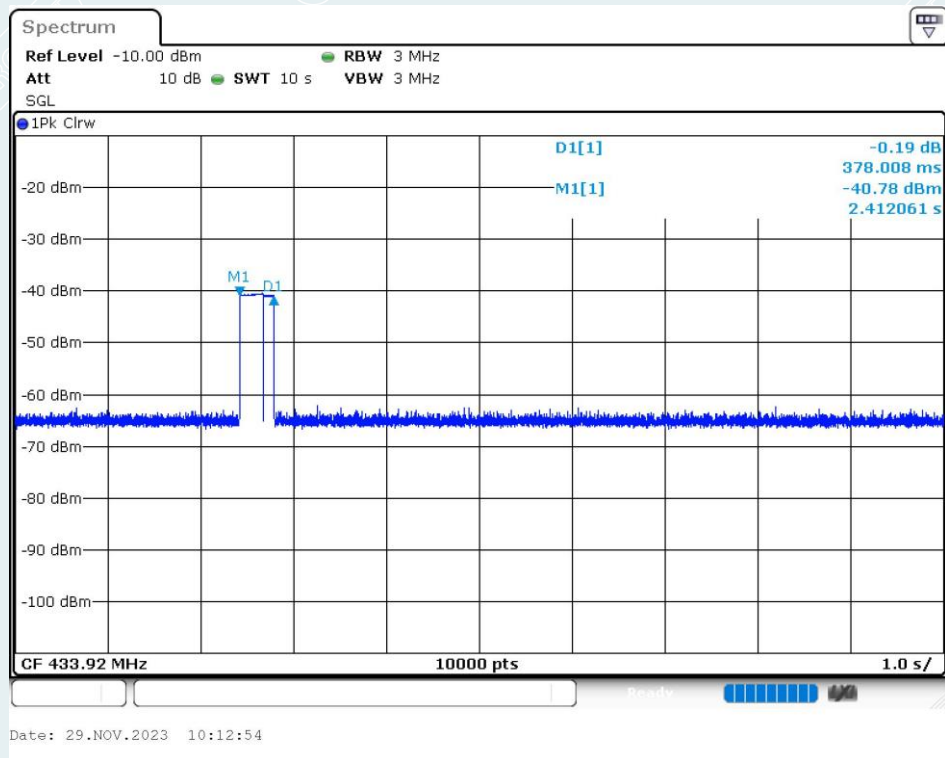
Frequency (MHz)	Transmission Time (s)	Limit (s)	Result
433.369	0.378	≤ 5	Pass

433.92MHz

Frequency (MHz)	Transmission Time (s)	Limit (s)	Result
433.92	0.378	≤ 5	Pass

Test Plot

433.369MHz



433.92MHz

APPENDIX A. PHOTOGRAPHS OF EUT TEST SETUP

Please refer to the attached document E202308027685-9-Test setup photo.

APPENDIX B. PHOTOGRAPHS OF EUT

Please refer to the attached document E202308027685-10-EUT Photo.

----- End of Report -----