TEST REPORT

Report No.: SHATBL2410011W01

Applicant	:	HAMATON AUTOMOTIVE TECHNOLOGY CO. ,LTD
Product Name	:	NLP Pro sensor
Brand Name	:	Hamaton
Model Name	:	NLP2024005
FCC ID	:	2AFH7NLP2024005
Test Standard	:	FCC Part 15.231
Date of Test	:	2024.10.26 - 2024.10.27

Report Prepared by : Chris Xu
(Chris Xu)

Report Approved by : Ghost Li.
(Ghost Li)

Authorized Signatory : Terry Yang
(Terry Yang)

GENERAL DESCRIPTION

Applicant's Name.....: HAMATON AUTOMOTIVE TECHNOLOGY CO. ,LTD

Address..... : 12 East Zhenxing Road, Lnping,Yuhang, Hangzhou, China

Manufacture's Name.....: HAMATON AUTOMOTIVE TECHNOLOGY CO. ,LTD

Address..... : 12 East Zhenxing Road, Lnping,Yuhang, Hangzhou, China

Product Description

Product Name..... : NLP Pro sensor

Brand Name.....: Hamaton

Model Name..... : NLP2024005

SeriesModel.....: NLP2024006

Test Standards..... : FCC Part 15.231

Test Procedure.....: ANSI C63.10-2013

This device described above has been tested by ATBL, the test results show that the equipment under test (EUT) is in compliance with the requirements of FCC Part 15.231. And it is applicable only to the tested sample identified in the report.
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Date of receipt of test item.....: 2024.10.17

Date (s) of performance of tests.....: 2024.10.26 - 2024.10.27

Date of Issue.....: 2024.10.28

Test Result..... : **Pass**

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	2024.10.28	SHATBL2410011W01	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part 15.231,Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	--
15.205(a)/15.209/ 15.231.(b)	Radiated Spurious Emission	PASS	--
15.231(a)(1)	Transmission requirement	PASS	--
15.231(C)	20 dB Bandwidth	PASS	--
15.203	Antenna Requirement	PASS	--

NOTE:

(1) 'N/A' denotes test is not applicable in this Test Report.

(2) All tests are according to ANSI C63.10-2013.

(3) The power is less than 1mW.

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	NLP Pro sensor
Trade Name	Hamaton
Model Name	NLP2024005
Series Model	NLP2024006
Model Difference	All sensors with same hardware, but with different valves shape, like, cap, flowthrough, long short flex and short flex.
Frequency band	433.92 MHz
Power input	1.8-3.6V DC
Modulation Type	FSK
Antenna type:	Built-in antenna
Antenna gain:	1.4 dBi
Battery:	Model:BR1632 Brand:Panosonic Rated Voltage:3.0 V Charge Limit Voltage:N/A
Hardware version number	V1.0
Software version number	V1.38
Temperature Range:	-40C°~+85C°

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	Built-in antenna	N/A	1.4	Antenna

2.2 DESCRIPTION OF THE TEST MODES

For conducted test items and radiated spurious emissions
Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively.

Pretest Mode	Description
Mode 1	TX Mode

Note:
(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

For Conducted Emission

Test Case	
Conducted Emission	TX Mode

2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During test, Keep EUT is in continuous transmission mode, Both open button and closed button have been tested, The two keys were tested to assess and only record the worst case in the report (Open botton).

E-1
EUT

2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
N/A	N/A	N/A	N/A	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model	Type No.	Note
N/A	N/A	N/A	N/A	N/A	N/A

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.5 LABORATORY INFORMATION

Company Name:	Shanghai ATBL Technology Co., Ltd.
Address:	Building 8, No. 160, Basheng Road, Waigaoqiao Free Trade Zone, Pudong New Area, Shanghai
Telephone:	+86(0)21-51298625

2.6 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ±U**, where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95** %.

No.	Item	Uncertainty
1	RF output power, conducted	±0.68dB
2	Unwanted Emissions, conducted	±2.988dB
3	All emissions, radiated 9K-30MHz	±2.84dB
4	All emissions, radiated 30M- 1GHz	±4.39dB
5	All emissions, radiated 1G-6GHz	±5.10dB
6	All emissions, radiated>6G	±5.48dB
7	Conducted Emission (9kHz- 150kHz)	±2.79dB
8	Conducted Emission (150kHz-30MHz)	±2.80dB

2.7 EQUIPMENTS LIST

2.7.1 Radiation Test equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
1	Signal analyzer	Agilent	N9020A	MY50200811	2024.03.28	2025.03.27
2	Amplifier	JPT	JPA0118-55-303A	1910001800055000	2024.03.28	2025.03.27
3	Amplifier	JPT	JPA-10M1G32	21010100035001	2024.03.28	2025.03.27
4	Antenna/Turn table Controller	Brilliant	N/A	N/A	N/A	N/A
5	Loop Antenna(9kHz-30 MHz)	Daze	ZN30900C	20077	2024.05.17	2025.05.16
6	Bilog Antenna	SCHWARZBECK	VULB 9168	01174	2024.05.17	2025.05.16
7	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120D	02334	2024.05.17	2025.05.16
8	Horn Antenna	COM-POWER	AH-1840	10100008	2024.07.19	2025.07.18
9	Thermometer	DeLi	N/A	N/A	2024.07.18	2025.07.17
Test Software						
Name of Software:	FALA					
Version:	EMC-RI(Ver.4A2)					

2.7.2 Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Equipment No.	Calibrated Until
EMI Test Receiver	R&S	ESPI	100679	SHATBL-E012	2025.03.27
LISN	R&S	ENV216	101300	SHATBL-E013	2025.03.27
LISN	R&S	ENV216	100333	SHATBL-E041	2025.03.27
CE Cable	Chuangcexing	2M	N/A	SHATBL-E014	2025.03.27
Temperature & Humidity	Deli	Deli	N/A	SHATBL-E015	2025.07.17
Testing Software	FALA	EZ-EMC(Ver.EMC-CON 3A1.1)		SHATBL-E044	N/A

2.7.3 RF Connected Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
1	Spectrum Analyzer	Keysight	N9020A	MY50510136	2024.07.18	2025.07.17
2	Vector signal generatorr	Keysight	N5182B	MY57300196	2024.07.18	2025.07.17
3	Analog signal generator	Agilent	N5182A	MY48180764	2024.07.18	2025.07.17
4	Power Sensor	RPR3006W	Rediteq	RPR6W-2201002	2024.07.18	2025.07.17
	Power Sensor	RPR3006W	Rediteq	RPR6W-2201003	2024.07.18	2025.07.17
5	Wideband radio communication testerCOMMUNICATION TESTER	R&S	CMW500	101331	2024.07.18	2025.07.17
6	Spreader	cesheng	WCSX07	2021.11.04.01	2024.08.19	2025.08.18
7	Frequency Extender	R&S	Z800A	W14	2024.08.25	2025.08.24
8	Adjustable attenuator	Agilent	8496B	MY42143776	2024.07.18	2025.07.17
9	constant temperature and humidity test chamber	KSON	THS-B6C-150	9159K	2024.03.28	2025.03.27
10	Temperature/ Humidity Meter	DeLi	DeLi	N/A	2024.07.18	2025.07.17
Test Software						
Name of Software:		WCS-WCN				
Version:		24.10.11				

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table .

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi- peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.2 TEST PROCEDURE

a. The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

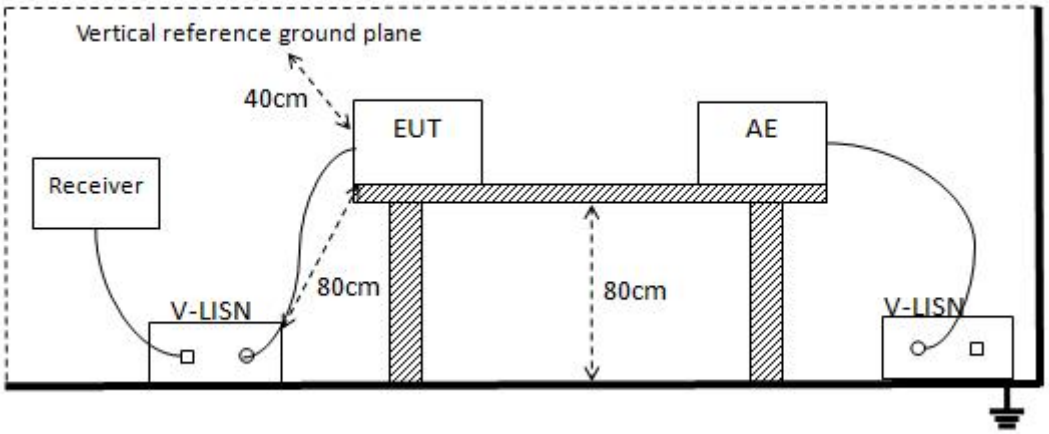
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

d. LISN is at least 80 cm from the nearest part of EUT chassis.

e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3 TEST SETUP



3.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.5TEST RESULTS

Temperature:	N/A	Relative Humidity:	N/A
Test Voltage:	N/A	Phase :	L/N
Test Mode:	N/A		

Note: EUT is only power by battery, So it is not applicable for this test.

4. RADIATED EMISSION MEASUREMENT

4.1 RADIATED EMISSION LIMITS

In case the emission fall within the restricted band specified on Part 15.205(a), then the Part 15.209(a)and Part 15.231(b) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (Frequency Range 9kHz-1000MHz)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~40.66	100	3
40.70~70	100	3

Fundamental Frequency (MHz)	Field Strength of fundamental (microvolts/meter)	Field Strength of Unwanted Emissions (microvolts/meter)
40.66~40.70	2,250	225
70~130	1,250	125
130~174	1,250 to 3,750**	125 to 375**
174~260	3750	375
260~470	3,750 to 12,500**	375 to 1,250**
Above 470	12,500	1,250

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAk	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC Part 15.231.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

Spectrum Parameter	Setting
Detector	Peak
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1MHz / 3MHz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.2 TEST PROCEDURE

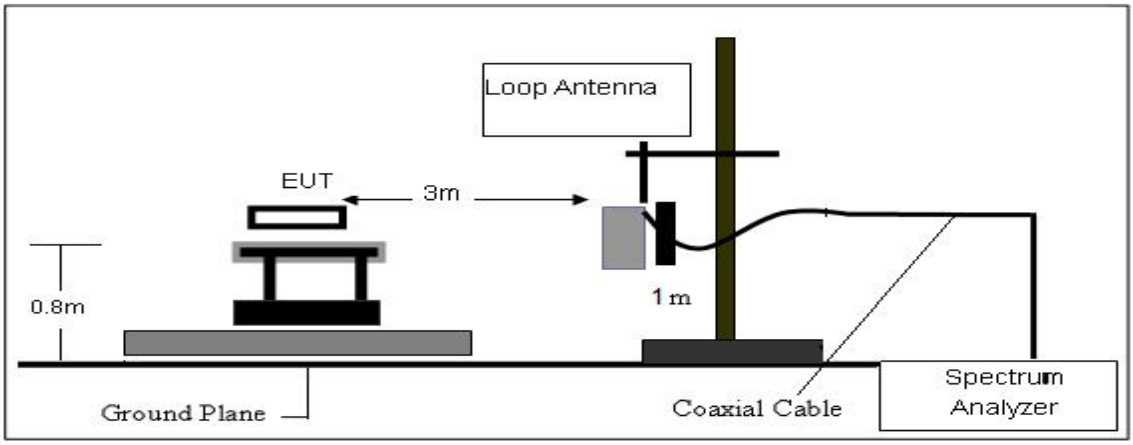
a. The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz,and above 1GHz.
b. The EUT was placed on the top of a rotating table 0.8 meters(above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

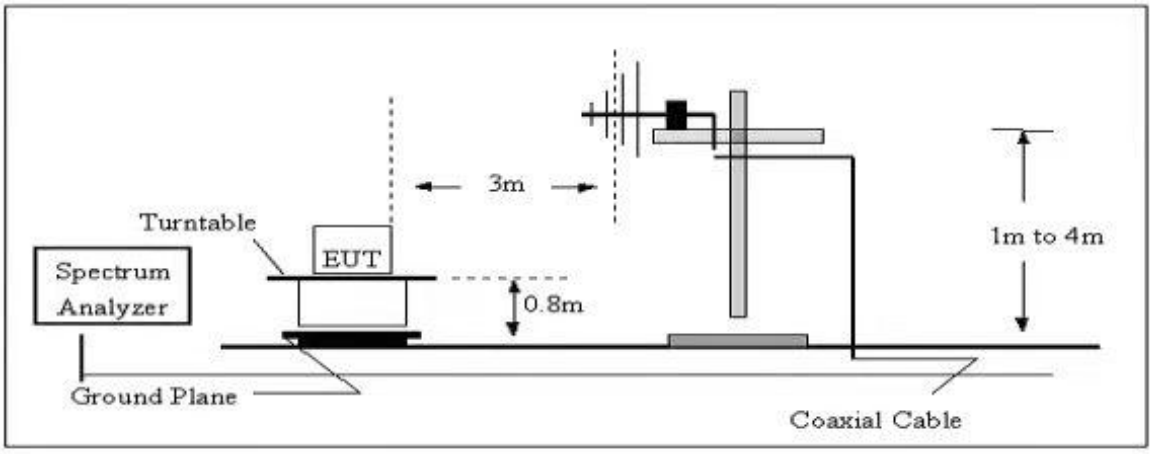
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

4.3 TEST SETUP

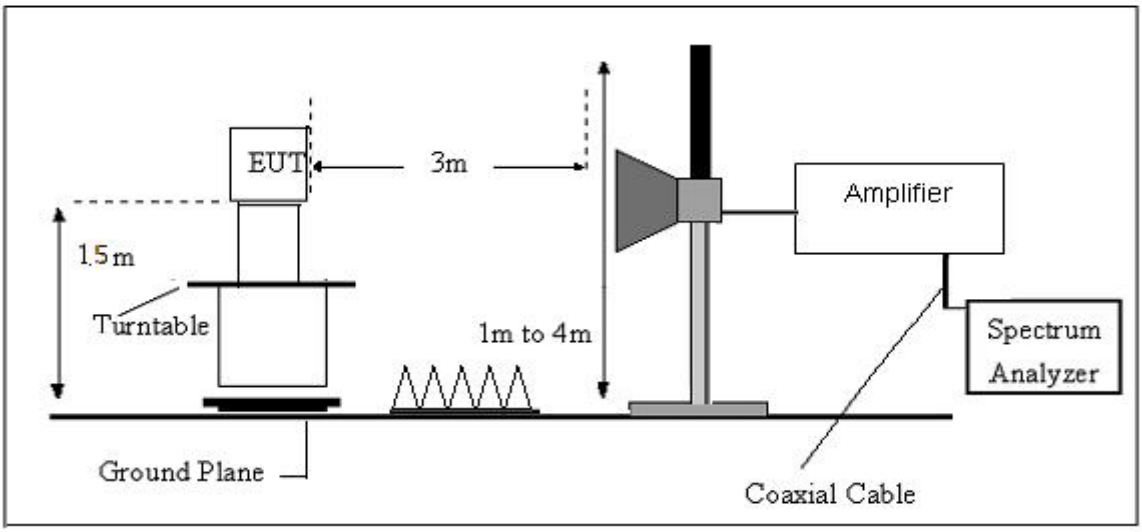
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



4.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

4.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

Factor=AF+CL-AG

4.6TEST RESULTS

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

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

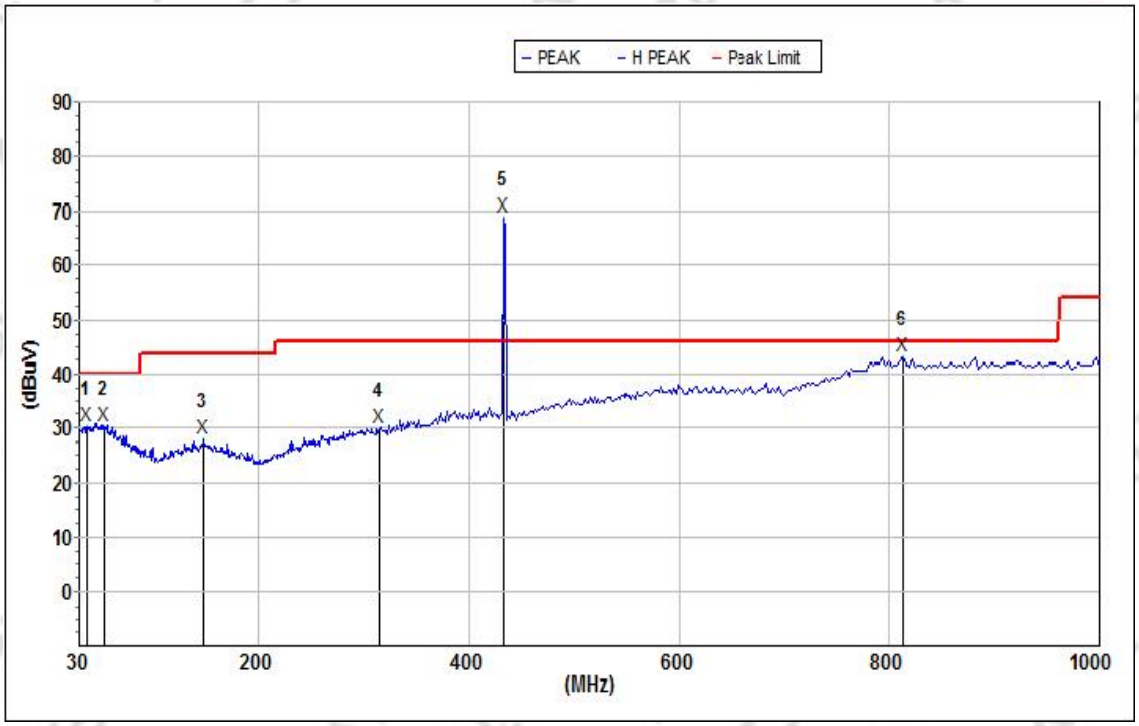
Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

(30MHz -1000MHz)

Temperature:	23.3℃	Relative Humidity:	48%RH
Test Voltage:	DC 3V	Phase:	Horizontal
Test Mode:	TX Mode 1		

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain

Mode 1 Horizontal



Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	37.285	30.4	40.0	9.6	18.8	29.5	0.9	H
2	54.071	30.3	40.0	9.7	18.9	29.7	1.0	H
3	147.921	28.0	43.5	15.5	19.0	33.5	1.6	H
4	314.376	30.2	46.0	15.8	19.5	32.1	2.2	H
5	432.546	68.9	80.1	-	-	-	-	H
6	813.112	43.2	46.0	2.8	28.6	31.7	3.4	H

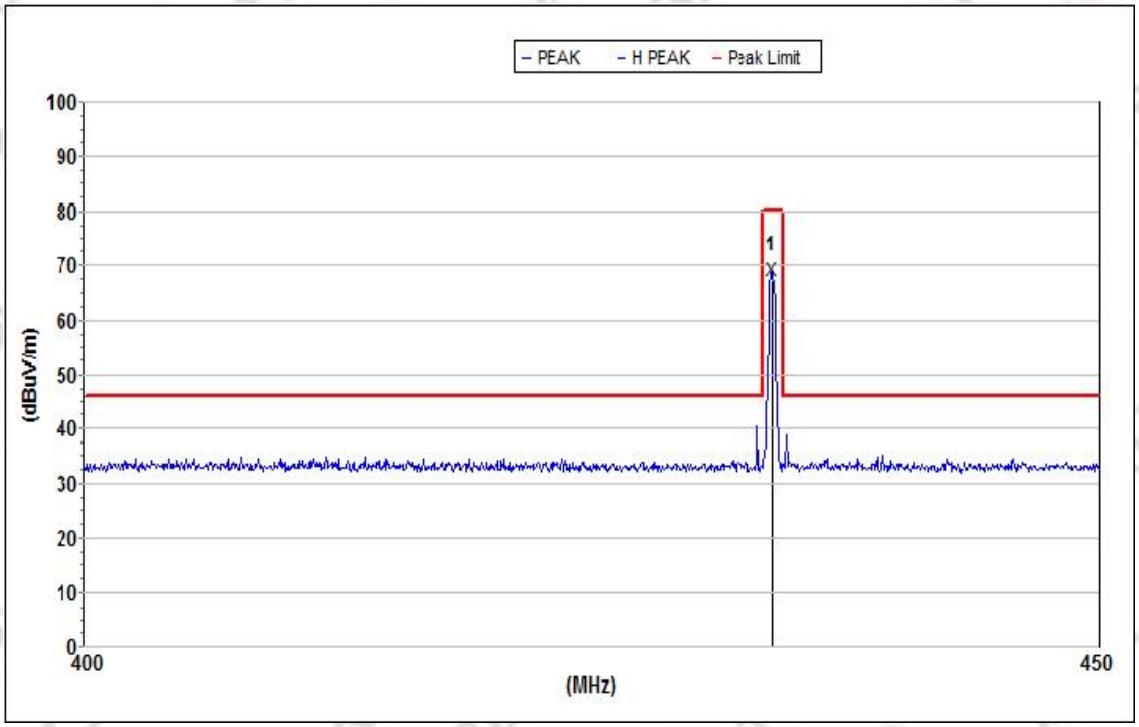
Note:Mark 5 in the picture above is the Fundamental frequency,which is not considered in this test.

(30MHz -1000MHz)

Temperature:	23.3℃	Relative Humidity:	48%RH
Test Voltage:	DC 3.3V	Phase:	Horizontal
Test Mode:	TX Mode		

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
3. If the Peak value below the AV/QP Limit, the AV/QP test doesn't perform for this submission.

433.92 Horizontal

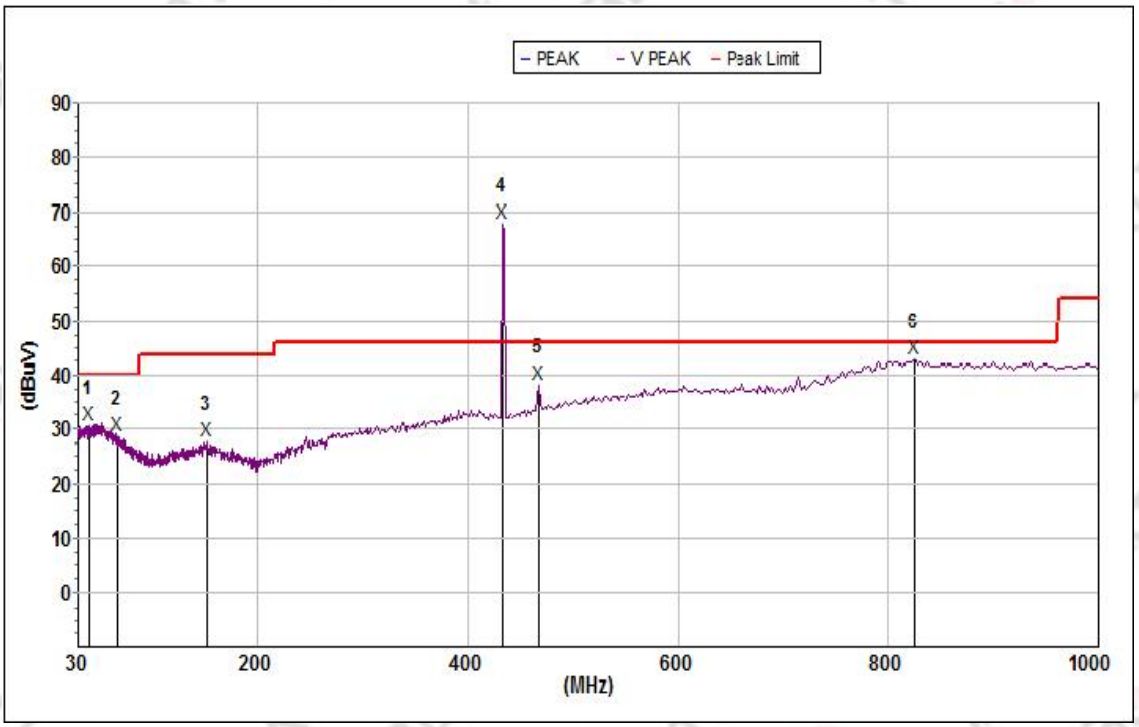


Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	433.920000	67.2	80.1	12.9	22.4	33.2	2.5	H

Temperature:	23.3℃	Relative Humidity:	48%RH
Test Voltage:	DC 3V	Phase:	Vertical
Test Mode:	TX Mode 1		

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain

Mode 1 Vertical



Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	40.559	30.8	40.0	9.2	19.0	29.6	0.9	H
2	66.733	28.9	40.0	11.1	16.9	29.4	1.1	H
3	152.130	27.7	43.5	15.8	19.1	33.6	1.6	H
4	432.546	67.8	80.1	-	-	-	-	H
5	467.235	38.5	46.0	7.5	23.1	33.2	2.6	H
6	824.597	42.8	46.0	3.2	28.6	31.8	3.4	H

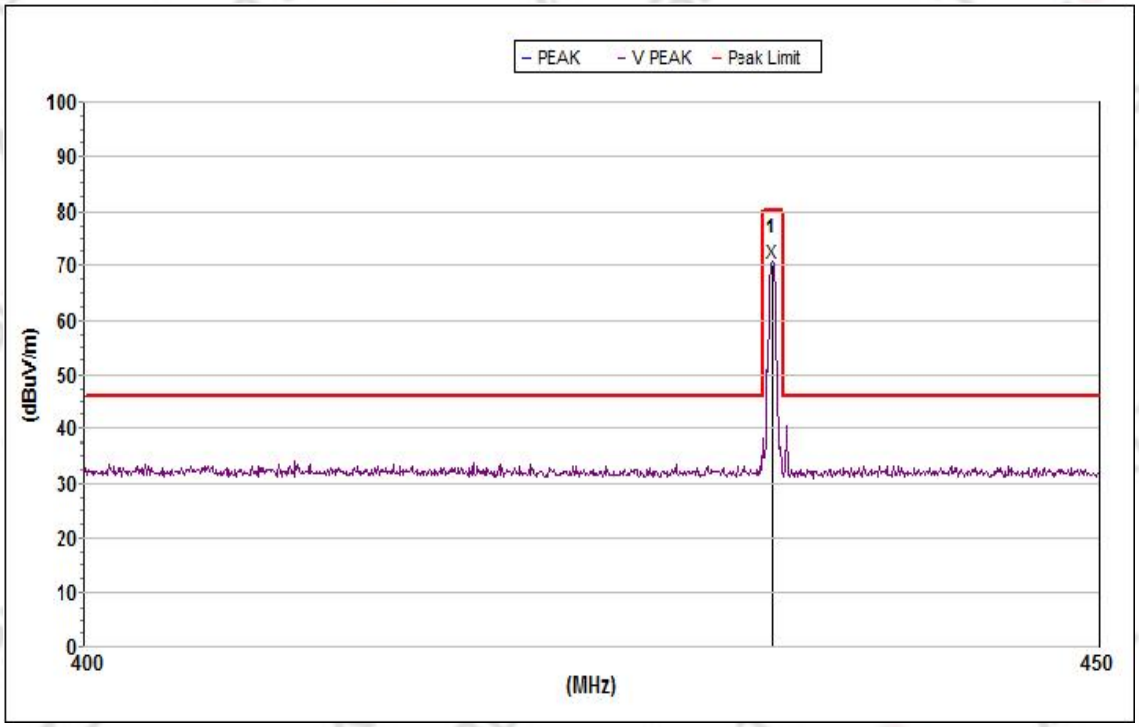
Note:Mark 4 in the picture above is the Fundamental frequency,which is not considered in this test.

(30MHz -1000MHz)

Temperature:	23.3℃	Relative Humidity:	48%RH
Test Voltage:	DC 3.3V	Phase:	Horizontal
Test Mode:	TX Mode		

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain
3. If the Peak value below the AV/QP Limit, the AV/QP test doesn't perform for this submission.

433.92 Horizontal



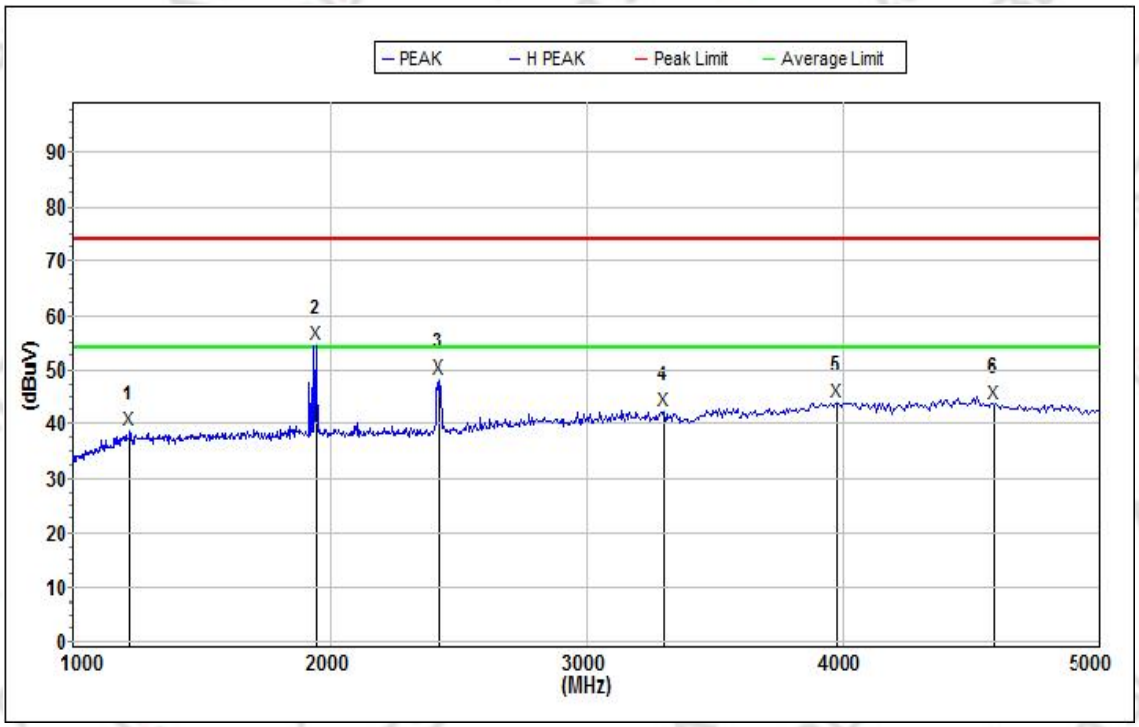
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	433.920000	70.4	80.1	9.7	22.4	33.2	2.5	V

(1000MHz -5000MHz)

Temperature:	23.3℃	Relative Humidity:	48%RH
Test Voltage:	DC 3V	Phase:	Horizontal
Test Mode:	TX Mode 1		

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain

Mode 1 Horizontal



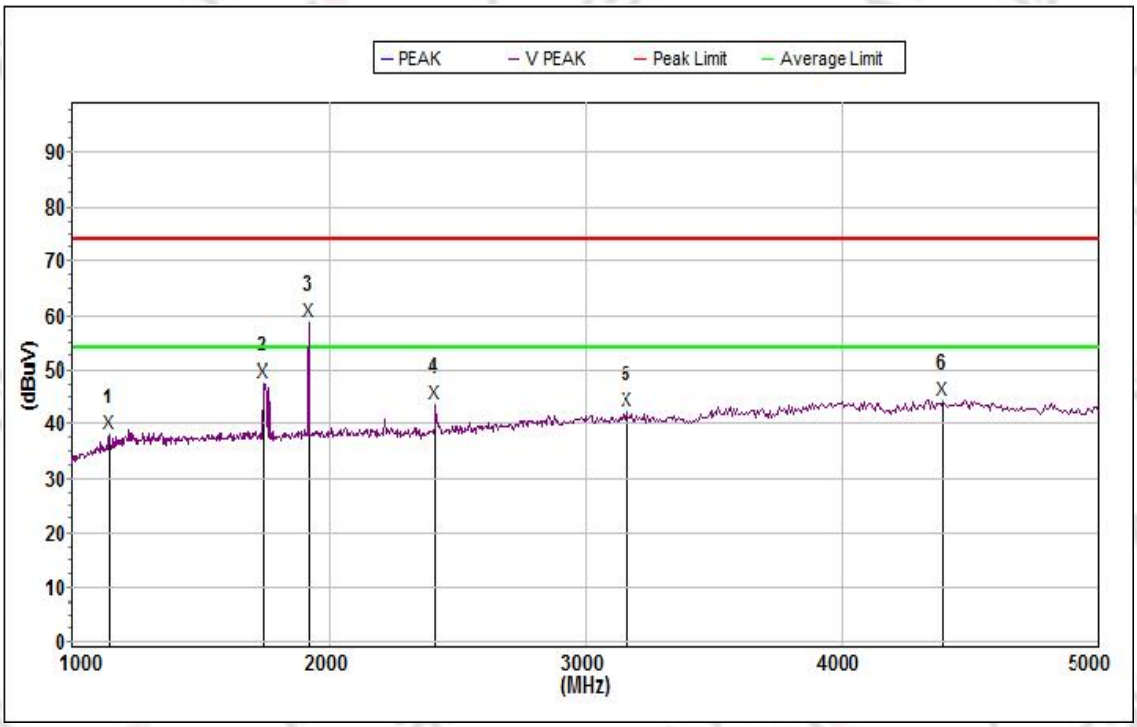
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	1218.915	38.9	74.0	35.1	25.7	58.1	4.3	H
2	1947.034	54.6	74.0	19.4	26.1	58.9	5.2	H
3	2427.350	48.2	74.0	25.8	27.4	59.6	5.7	H
4	3300.926	42.4	74.0	31.6	29.5	58.4	6.7	H
5	3972.074	44.2	74.0	29.8	30.8	58.0	7.2	H
6	4591.183	43.9	74.0	30.1	31.9	59.5	7.6	H

(1000MHz -5000MHz)

Temperature:	23.3℃	Relative Humidity:	48%RH
Test Voltage:	DC 3V	Phase:	Vertical
Test Mode:	TX Mode 1		

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain

Mode 1 Vertical



Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.F/G. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	1142.917	38.2	74.0	35.8	25.5	58.5	4.2	V
2	1745.194	47.7	74.0	26.3	25.2	58.1	4.9	V
3	1922.126	59.0	74.0	15.0	26.0	58.7	5.2	V
4	2415.659	43.8	74.0	30.2	27.4	59.6	5.7	V
5	3160.556	42.5	74.0	31.5	29.4	58.5	6.6	V
6	4388.877	44.5	74.0	29.5	31.4	59.1	7.7	V

5. BANDWIDTH TEST

5.1 LIMIT

FCC Part15.231,Subpart C			
Section	Test Item	Limit	Result
15.231(C)	20 Bandwidth	The 20dB bandwidth of the emissions shall not exceed 0.25% of the center frequency	PASS

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth
RB	10 kHz (20dB Bandwidth)
VB	30 kHz (20dB Bandwidth)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

5.2 TEST SETUP

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.

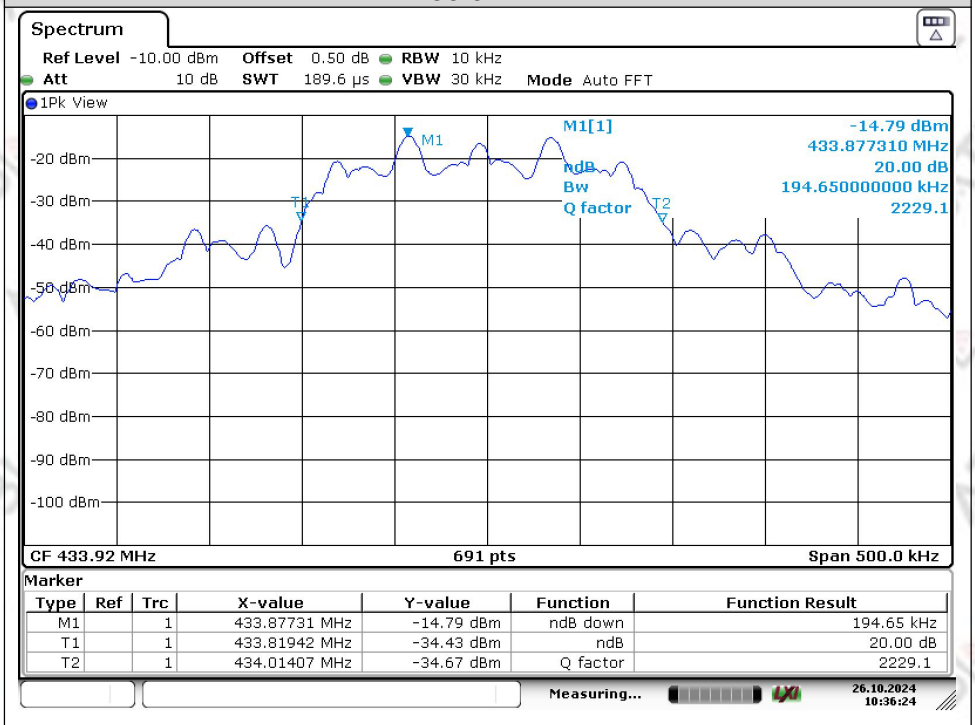
5.3 EUT OPERATION CONDITIONS

TX mode.

5.4 TEST RESULTS

Centre Frequency	Measurement		
	20dB Bandwidth (kHz)	Limit(kHz)	Frequency Range (MHz)
433.92	194.65	1084.8	PASS

433.92MHz



6. DUTY CYCLE

6.1 TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.

The Duty Cycle Was Determined By The Following Equation: To Calculate The Actual Field Intensity,The Duty Cycle Correction Factor In Decibel Is Needed For Later Use And Can Be Obtained From Following Conversion

Duty Cycle(%)=Total On Interval In A Complete Pulse Train/ Length Of A Complete Pulse Train * %

Duty Cycle Correction Factor(Db)=10 * Log10(Duty Cycle(%)

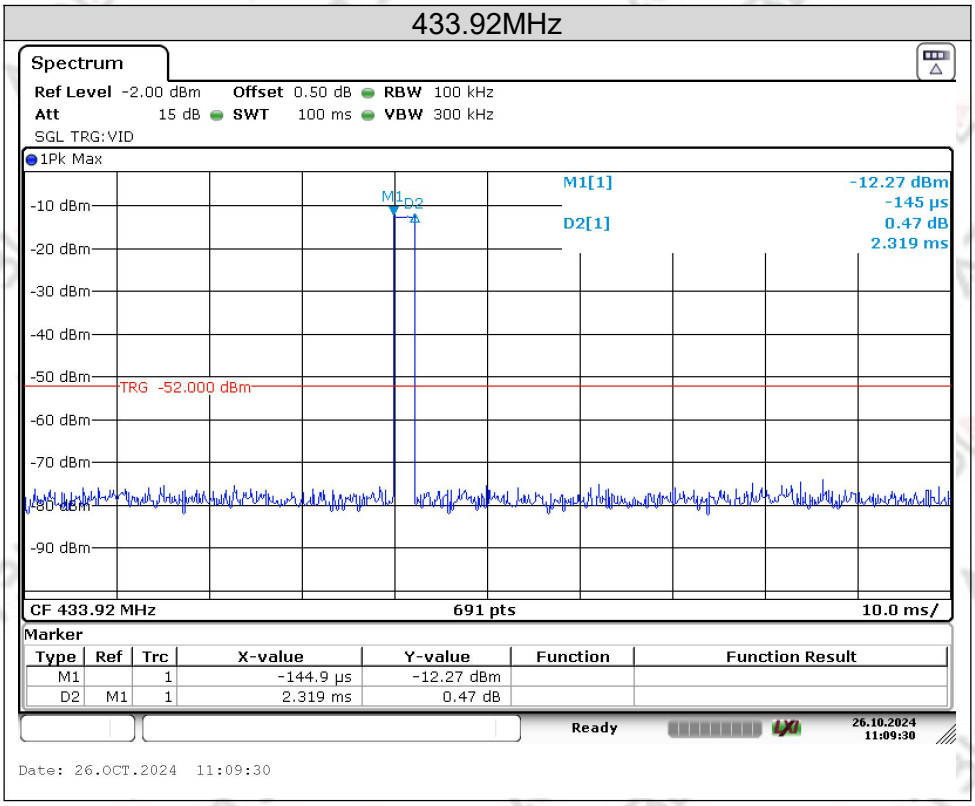
6.2 TEST SETUP

6.3 EUT OPERATION CONDITIONS

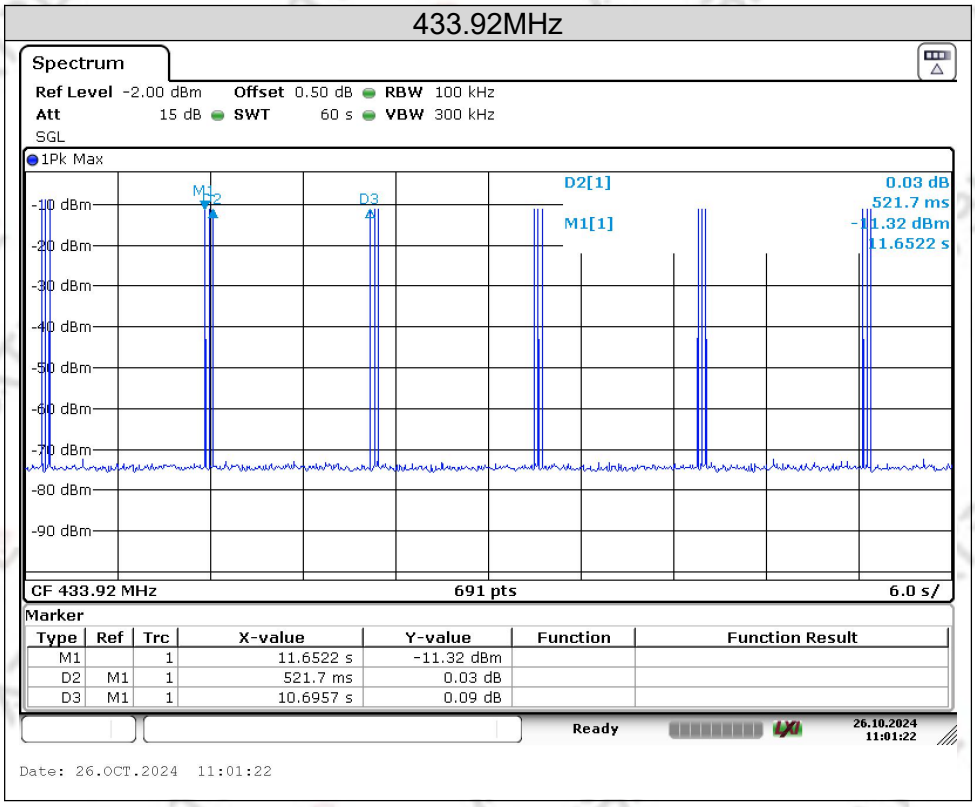
TX mode.

6.4 TEST RESULTS

FCC Part15.231(a)	
Ton(ms)	6.957
Tperiod(ms)	10695.7
Duty Cycle (%)	0.065%
Duty Cycle Correction Factor(dB)	-23.74



Note：The graph shows the duration of 'on' signal. From Marker 1 to Delta 2, duration is 2.319ms



NOTE:

The duty cycle is simply the on time divided by the period:
Effective period ofone cycle=(3x2.319)ms =6.957ms
One cycle = 10.6957s
Duty cycle(%) =6.957ms/10695.7ms=0.065
Therefore, the average factor is found by 20*log(0.065)= -23.74dB

7. AUTOMATICALLY DEACTIVATE

7.1 STANDARD REQUIREMENT

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

7.2 TEST PROCEDURE

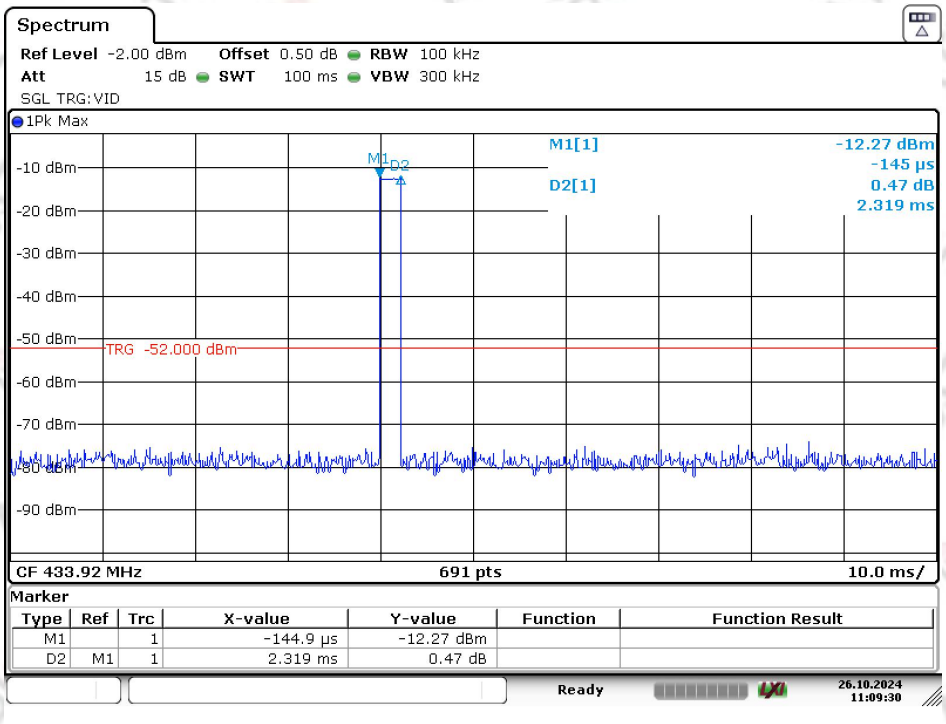
The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.

Spectrum Setting: RBW= 100kHz, VBW=300kHz, Sweep time = Auto.

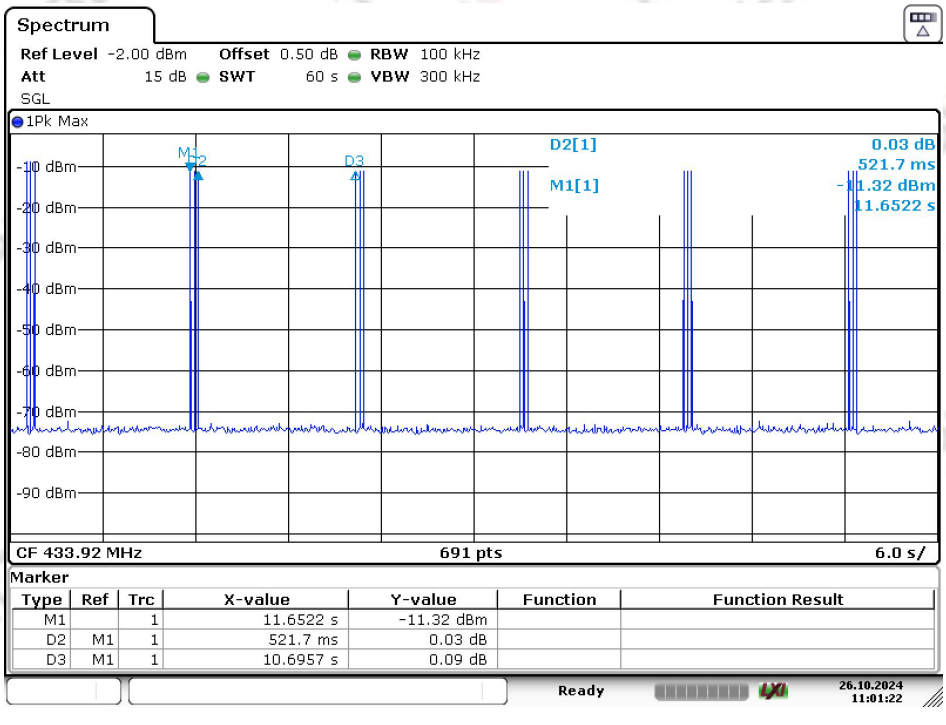
Note: Only press launch about 0.15 s

7.3 TEST SETUP

7.4 TEST RESULTS



Date: 26.OCT.2024 11:09:30



Date: 26.OCT.2024 11:01:22

Result:PASS
NOTE: Maximum Deactivate Time<5S.

8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

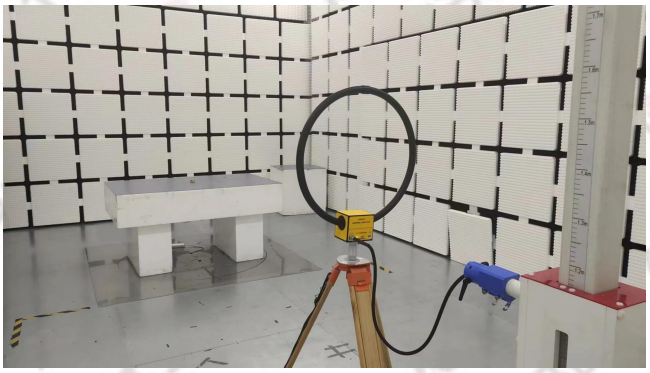
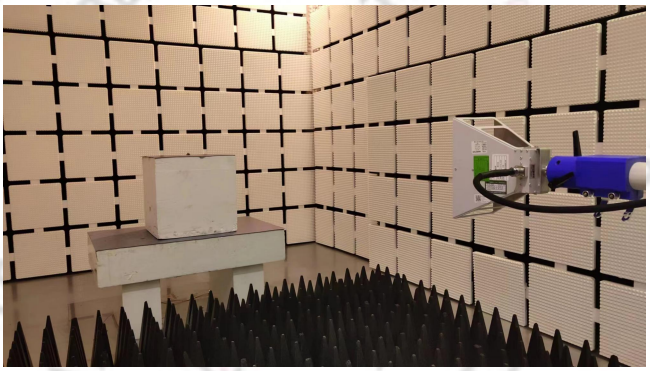
FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

8.2 EUT ANTENNA

The EUT antenna is Built-in Antenna, And the antenna gain is 1.4dBi.

The EU'T has one internal antenna arrangement which was permanently attachedIt conforms to the standard requirements.Please refer to EUT photos.

APPENDIX-PHOTOS OF TEST SETUP

Radiated Emissions for 9kHz~30MHz	Radiated Emissions for 30MHz~1GHz
	
Radiated Emissions for 1GHz~5GHz	**Near View**
	

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