



经续检验

SLG-CPC Testlaboratory

TEST REPORT

Report Number.....:	90291-25-72-25-PP001	
Date of issue.....:	Aug. 15, 2025	
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Standard(s)	FCC 47 CFR Part 15, Subpart C	
Test item description	Wireless remote control	
Trade Mark	N/A	
Model/Type reference	JJX-44J-RF433 (Refer to section 1.1 for details)	
FCC ID	2BRMMTTC-DC3V-2508	
Date of receipt of test item.....:	Aug. 01, 2025	
Date (s) of performance of test:	Aug. 02, 2025 - Aug. 14, 2025	
Test Report Form No.....:	FCC CFR Part 15C_B1	
Master TRF	Dated 2021-09	
Summary of Test Results	Pass	
The Summary of Test Results based on a technical opinion belongs to the standard(s).		
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Modified Information

Report No.	Revision Data	Summary
90291-25-72-25-PP001	Aug. 15, 2025	Original Version

1 EUT TECHNICAL DESCRIPTION

Characteristics	Description
Product:	Wireless remote control
Model Number:	JJX-44J-RF433 INV-12VAC30VDC, UHTT-18L/2F-M, UHTT-24L/4F-M, UHTT-30L/5F-M, UHTT-30LMF-M, UHTT-36L/4F-M, UHTT-36L/6F-M, UHTT-48L/8F-M, UHTT-54L/6F-M, UHTT-54L/9F-M, UHTT-60L/2F-M, CY-R-18L-M-2-T, CY-R-24L-M4T, CYR-30L-M-5-T, CY-R-30L-M-1-T, CYR-36L-M-4-T, CY-R-36L-M 6-T, CY-R-48L-M-8-T, CY-R-54L-M-6-T, CYR-54L-9-T, CY-R-60L-M-2-T UHTT-AL/BF-M-D, CY-R- AL-M-B-D A=1-100, represents Number of lamps, B=blank or 1-9, represents Number of parallel circuits M=A、 B or M, represents the color of lighting string, "A" may be replaced by "B" or "M". represents the color of lighting string. "A" represents LED lamp color. red, yellow or orange; "B" represents LED lamp color. blue, green, white, warm white, pink or violet, "M" is multi-color. D= blank or M5/C3/C6/C9/C30/F8. M5/03c6/c9/c30/f8 represents type of reflector, Blank represents provided without reflector (Note: All models are based on the same remote control. The different model names are just for the lamp model. Here we choose JJX-44J-RF433 as the EUT for the test)
Modulation:	ASK
Operating Frequency Range(s):	433.92 MHz
Max Transmit Power:	79.17 dBuV/m
Number of Channels:	1
Antenna Type :	PCB Antenna
Antenna Gain:	-0.2 dBi
Power supply:	☒ DC 3V from Battery

Note: for more details, please refer to the User's manual of the EUT.

2 SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
15.231(c)	20dB Emission Bandwidth	PASS	
15.209 & 15.231(b)	Radiated Emissions	PASS	
15.203	Antenna Requirement	PASS	
15.207	Conducted Emission	N/A	
15.231(a)	Transmission Time	PASS	
NOTE1: N/A (Not Applicable)			

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID:2BRMMTTC-DC3V-2508 filing to comply with Section 15.231 of the FCC Part 15, Subpart C Rules

3 TEST METHODOLOGY

3.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:
 FCC 47 CFR Part 15, Subpart C, Section 15.231

3.2 MEASUREMENT EQUIPMENT USED

Equipment	Manufacturer	Model	S/N	Last Cal.	DUE Cal.
RF Connected Test					
Vector Signal Generater	Rohde & Schwarz	SMBV100B(6G)	101166	2025/04/16	1 year
Analog Signal Generator	Rohde & Schwarz	SMB100A(40G)	181333	2025/06/18	1 year
Signal Analyzer	Rohde & Schwarz	FSV40	101527	2025/03/26	1 year
Power Analyzer	Rohde & Schwarz	OSP-B157W8	N/A	2025/04/16	1 year
Wideband Radio Communication Tester	R&S	CMW270	101985	2025/04/18	1 year
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	166898	2025/04/14	1 year
Temperature&Humidity test chamber	ESPEC	VC 4018	/	2025/03/26	1 year
Radiated Emission Test					
EMI Test Receiver	KEYSIGHT	N9010A	MY56070465	2024/12/03	1 year
EMI Test Receiver	Rohde & Schwarz	FSV40	101511	2025/01/10	1 year
Bilog Antenna	Schwarzbeck	VULB 9163	01335	2023/04/21	3 year
Broadband Antenna	Schwarzbeck	9162	139	2025/03/01	3 year
Power Amplifier	EMEC	EM330	060676	2025/03/11	3 year
Cable	Tuyue	F4309	L-400-NmNm-12000	2024/12/03	2 year
Horn Antenna	Schwarzbeck	BBHA9120D	1779	2025/03/28	3 year
Horn Antenna	Schwarzbeck	BBHA9170	00954	2022/09/13	3 year
Power Amplifier	Rohde & Schwarz	SCU08F2	008400019	2025/03/24	3 year
Power Amplifier	Rohde & Schwarz	SCU-18F	180118	2025/03/24	3 year
Power Amplifier	Rohde & Schwarz	SCU40A	100499	2023/06/21	3 year
Active Loop Antenna	ETS LINDGREN	6512	41623	2025/03/19	3 year
Test Software	Farad	EZ-EMC	Ver.CPC-3A1	/	/
Conducted Emission Test					
LISN	Schwarzbeck	NSLK 8127	8127-892	2025/03/17	1 year
LISN	Schwarzbeck	NSLK 8127	8127-437	2025/07/02	1 year
EMI Test Receiver	R&S	ESR3	102124	2024/12/03	1 year
Triple loop	R&S	HM020	834206/006	2024/12/03	2 year
Pulse Limiter	R&S	ESH3-Z2	357.8810.52	2024/12/03	1 year
Test Software	Farad	EZ-EMC	Ver.CPC-3A1	/	/

3.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

The following test modes were performed for test:433.92MHz

4 FACILITIES AND ACCREDITATIONS

4.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No. 11, Wu Song Road, Dongcheng District, Dongguan, Guangdong Province, China 523117

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 32.

4.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab. : Accredited by ISED, October 31 2023
CAB identifier: CN0126
Company Number: 27767

Accredited by A2LA, October 31 2023
The Certificate Registration Number is 6325.01

Accredited by FCC
Designation Number: CN1287
Test Firm Registration Number: 394054

Name of Firm : SLG-CPC Testlaboratory Co., Ltd.
Site Location : No. 11, Wu Song Road, Dongcheng District Dongguan,
Guangdong Province, 523117, People' s Republic of China

5 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

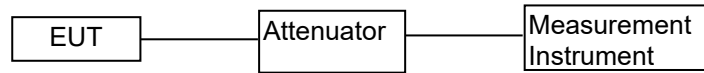
Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-5}$
Maximum Peak Output Power Test	$\pm 1.0\%$
Conducted Emissions Test	3.68dB
Radiated Emission Test	4.80dB (below 1G) 3.26dB (above 1GHz)
Occupied Bandwidth Test	$\pm 0.9\%$
Band Edge Test	$\pm 2.3\%$
All emission, radiated	$\pm 1.2\%$
Antenna Port Emission	$\pm 3\text{dB}$
Temperature	$\pm 3.2\%$
Humidity	$\pm 2.5\%$

Measurement Uncertainty for a level of Confidence of 95%

6 SETUP OF EQUIPMENT UNDER TEST

6.1 RADIO FREQUENCY TEST SETUP 1

The component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



6.2 RADIO FREQUENCY TEST SETUP 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

Above 30MHz:

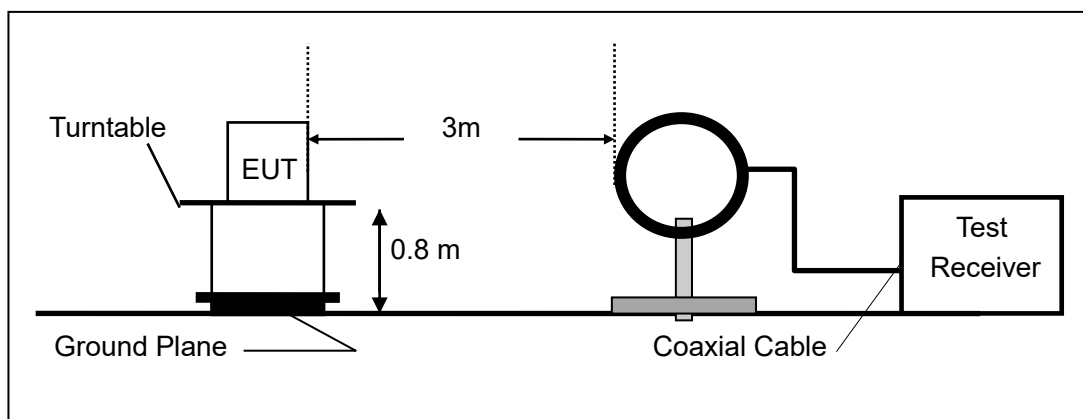
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:

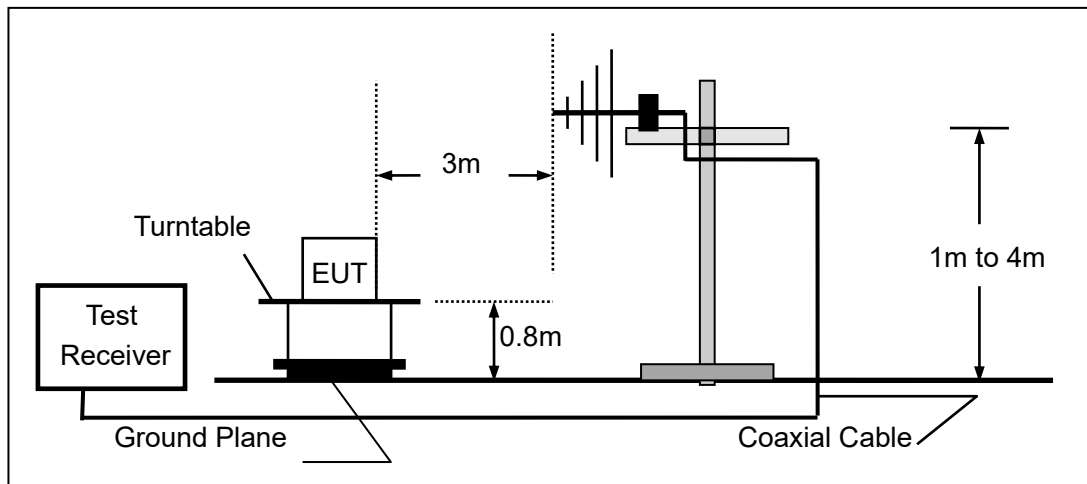
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)

The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

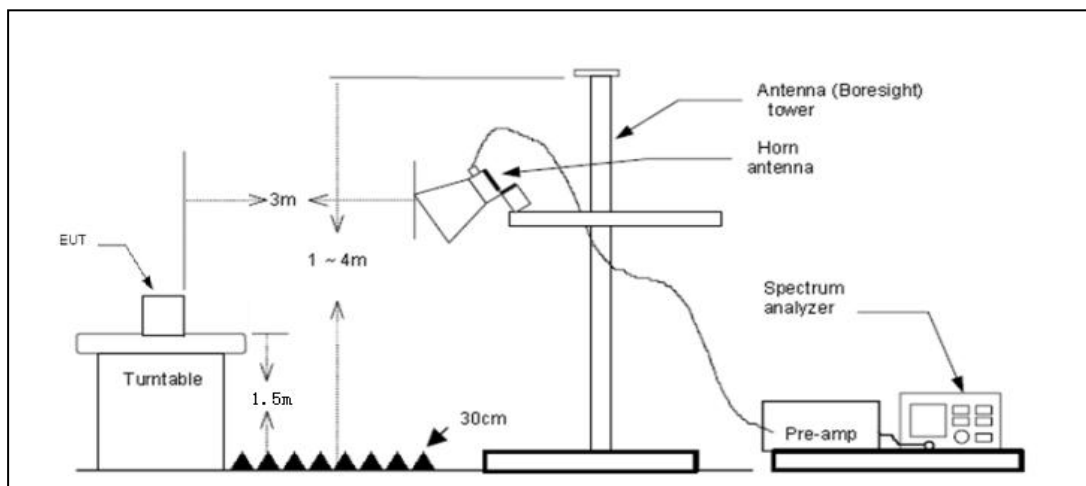
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

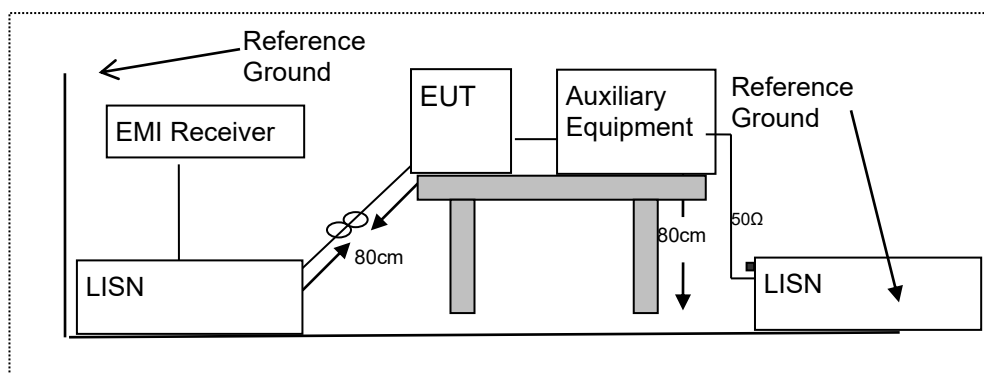


6.3 CONDUCTED EMISSION TEST SETUP

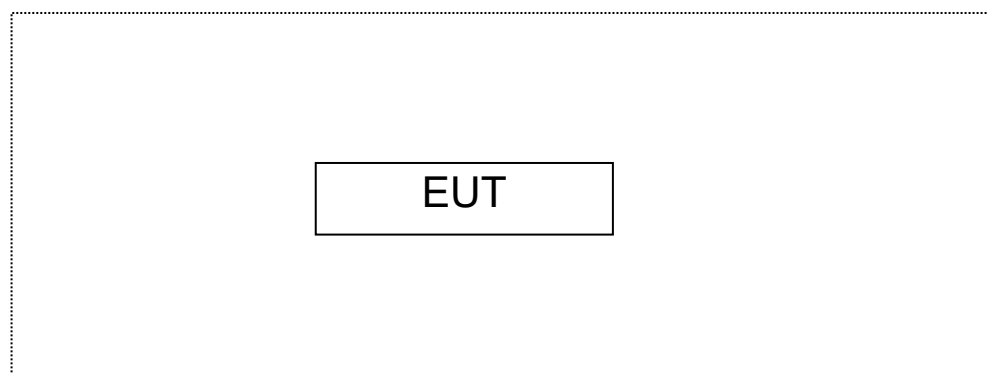
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.8 m.

According to the requirements in ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



6.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



6.5 SUPPORT EQUIPMENT

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

7 TEST REQUIREMENTS

7.1 20dB EMISSION BANDWIDTH

7.1.1 Applicable Standard

According to FCC part 15.231(c)

7.1.2 Conformance Limit

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.

7.1.3 Test Configuration

Test according to clause 6.1 radio frequency test setup 1

7.1.4 Test Procedure

The EUT was operating in transmit mode and controlled its channel. Printed out the test result from the spectrum by hard copy function.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously

Set RBW = approximately 1% -5% of the 20dB emission bandwidth.

Set the video bandwidth (VBW) = 3*RBW.

Set Span= approximately 2 to 3 times the occupied bandwidth

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the markerdelta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

Measure and record the results in the test report.

Test Results

Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

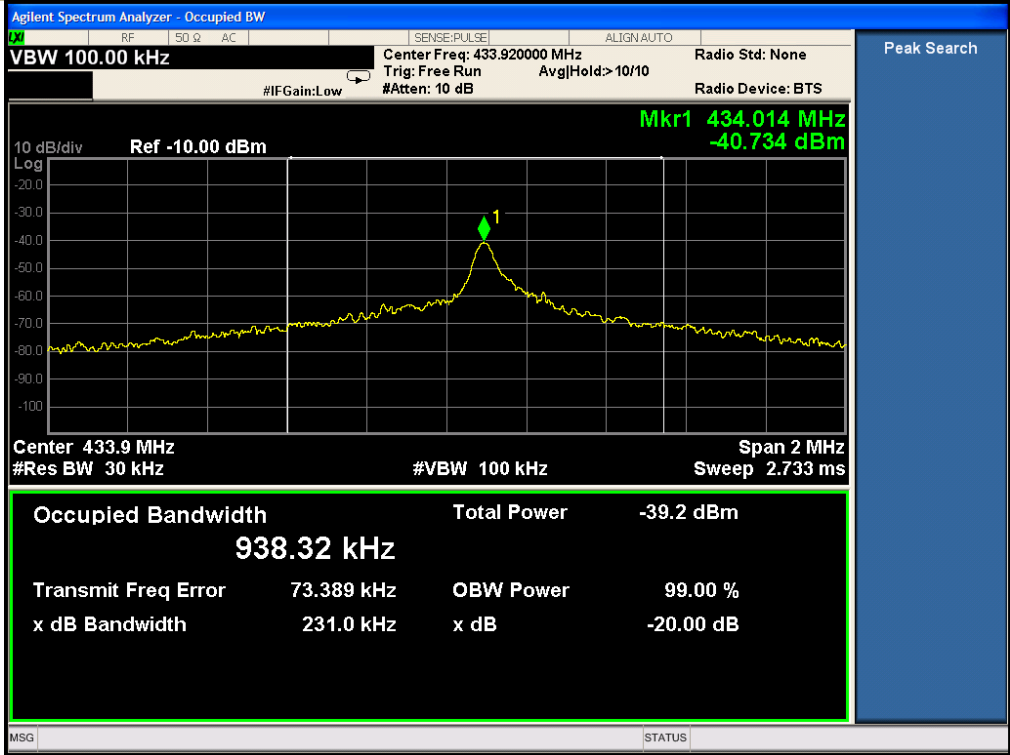
Modulation Mode	Channel Number	Channel Frequency (MHz)	Measurement Bandwidth (kHz)	Limit (kHz)	Verdict
ASK	1	433.92	231.0	≤1084.8	PASS
Note: Limit=0.5% of the center frequency=433.92MHz * 0.25% = 1084.8KHz					

Test Model

Occupied Bandwidth

Channel 0: 433.92MHz

ASK Modulation



7.2 TRANSMISSION CEASE TIME

7.2.1 Applicable Standard

According to FCC part 15.231(a)

7.2.2 Conformance Limit

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

7.2.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

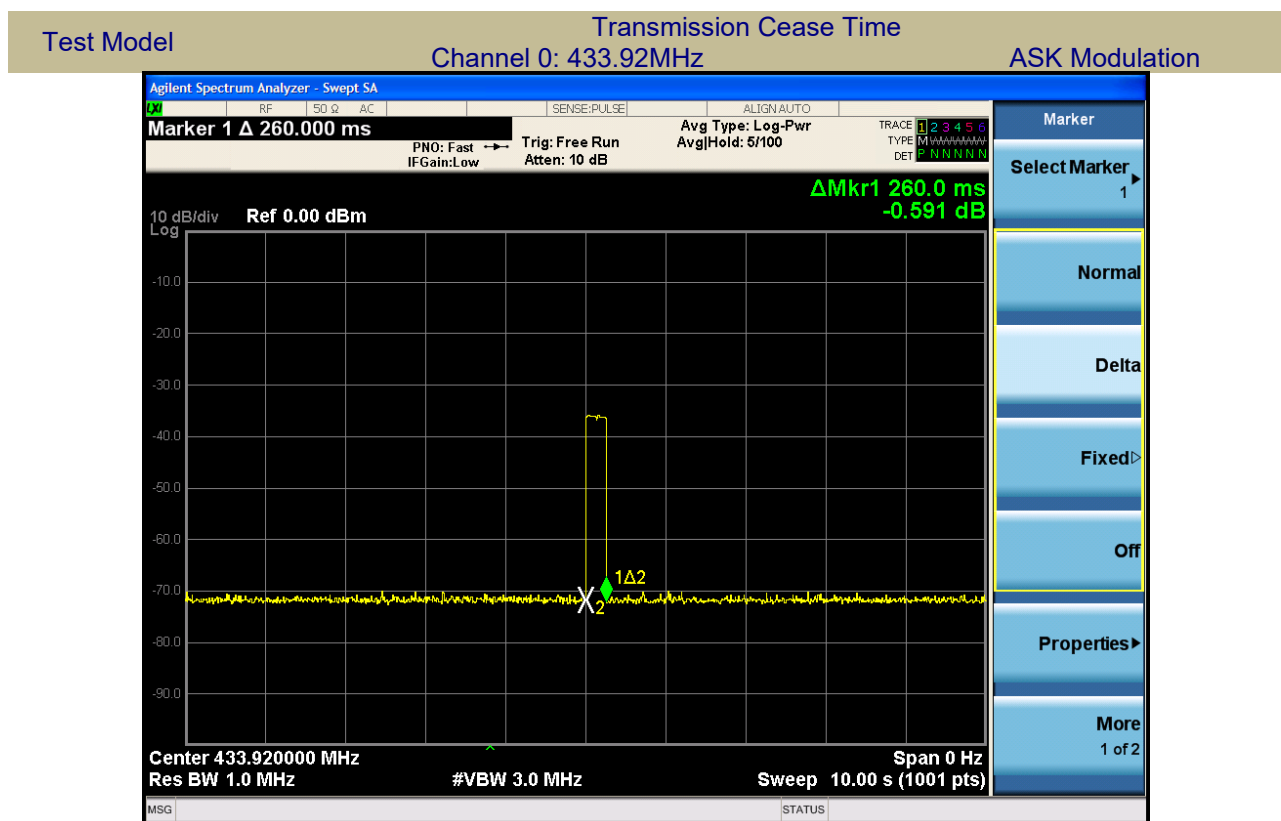
7.2.4 Test Procedures

With the EUT's antenna attached, the EUT's output signal was received by the test antenna, which was connected to the spectrum analyzer. Set the center frequency to 433.92MHz, then set the spectrum analyzer to Zero Span for the release time reading. During the testing, the transmission duration was measured and recorded.

7.2.5 Test Results

Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

Frequency MHz	Transmission Cease Time	Limit	Result
433.92	0.26s	5s	Pass



7.3 RADIATED SPURIOUS EMISSION

7.3.1 Applicable Standard

According to FCC Part 15.231(b) and 15.209

7.3.2 Conformance Limit

Intentional radiators may operate at a periodic rate exceeding that specified in paragraph (a) of this section and may be employed for any type of operation, including operation prohibited in paragraph (a) of this section, provided the intentional radiator complies with the provisions of paragraphs (b) through (d) of this section, except the field strength table in paragraph (b) of this section is replaced by the following:

According to FCC Part 15.231 the field strength Limited

Frequencies (MHz)	Field strength of fundamental @3m		Effective limit for 433.92MHz	
	(uV/m)	dB(uV/m)	(uV/m)	dB(uV/m)
40.66-40.70	2250	67		
70-130	1250	62		
130-174	1250 to 3750*	62 to 71.5*		
174-260	3750	71.5		
260-470	3750 to 12500*	71.5 to 81.9*	10996.67	80.82
Above 470	12500	81.9		

* Linear interpolation

Frequencies (MHz)	Field strength of Spurious emissions @3m		Effective limit for 433.92MHz	
	(uV/m)	dB(uV/m)	(uV/m)	dB(uV/m)
40.66-40.70	225	47		
70-130	125	41.9		
130-174	125 to 375*	41.9 to 51.5*		
174-260	375	51.5		
260-470	375 to 1250*	51.5 to 61.9*	1099.67	60.82
Above 470	1250	61.9		

* Linear interpolation

The field intensity in micro-volts per meter can then be determined by the following equation: $FI(V/m) = 10FI(dBV/m) / 20$ The FCC specified emission limits were calculated according to the EUT operating frequency and obtained by following linear interpolation equations:

(a) For fundamental frequency:

$$f_{EUT} : \text{EUT Operating Frequency Emission Limit (V/m)}$$

$$= [f_{EUT}(\text{MHz}) - 260(\text{MHz})] \times \frac{12500(\text{V/m}) - 3750(\text{V/m})}{470(\text{MHz}) - 260(\text{MHz})} + 3750(\text{V/m})$$

(b) For spurious frequencies:

$$f_{EUT} : \text{EUT Operating Frequency Emission Limit (V/m)}$$

$$= [f_{EUT}(\text{MHz}) - 260(\text{MHz})] \times \frac{1250(\text{V/m}) - 375(\text{V/m})}{470(\text{MHz}) - 260(\text{MHz})} + 375(\text{V/m})$$

Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).

FCC Part15 (15.231) , Subpart C		
Fundamental Frequency	Field Strength Of Fundamental	Field Strength of Spurious Emissions
433.92MHz	AV:80.82 dBuV/m at 3m distance	AV:60.82 dBuV/m at 3m distance
	PK:100.82dBuV/m at 3m distance	PK:80.82 dBuV/m at 3m distance

According to FCC Part15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	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	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	(2)
13.36-13.41			

According to FCC Part15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009~0.490	2400/F(KHz)	300	See the remark
0.490~1.705	24000/F(KHz)	30	
1.705~30.0	30	30	
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Remark :1. Emission level in dBuV/m=20 log (uV/m)

2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

3. Distance extrapolation factor =40log(Specific distance/ test distance)(dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor.

for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

7.3.3 Test Configuration

Test according to clause 6.2 radio frequency test setup 2

7.3.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 100 kHz for $f < 1$ GHz(30MHz to 1GHz), 200Hz for $f < 150$ KHz(9KHz to 150KHz), 9KHz for $f < 30$ MHz(150KHz to 30MHz), 1MHz for $f < 5$ GHz

VBW $\geq$ RBW Sweep = auto

Detector function = peak

Trace = max hold

Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

- Calculation of Average factor

The output field strengths of specification in accordance with the FCC rules specify measurements with an average detector. During the test, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.

The duty cycle is measured in 100ms or the repetition cycle period, whichever is a shorter time frame, the duty cycle is measured by placing the spectrum analyzer to set zero span at 100kHz resolution bandwidth.

Averaging factor in dB = $20\log(\text{duty cycle})$

Repeat above procedures until all frequency measured was complete.

Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

7.3.5 Test Results

■ Spurious Emission below 30MHz (9KHz to30MHz)

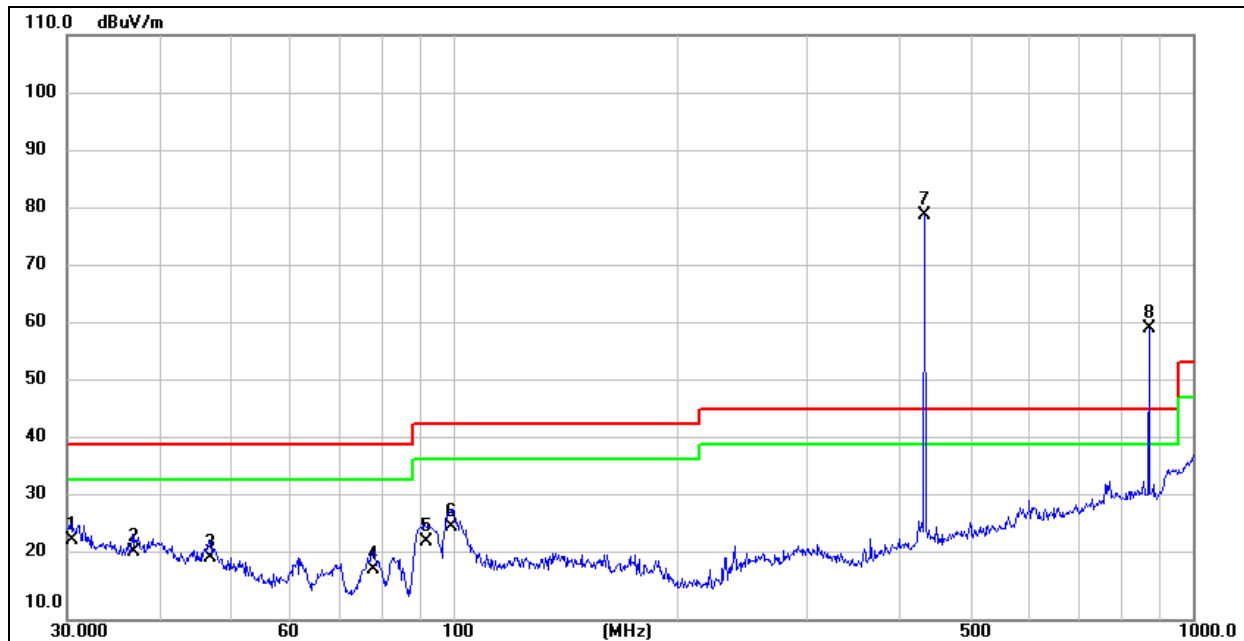
Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
--	--	--	--	--	--	--	--

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

■ Radiated spurious emission (30MHz ~ 1GHz)

All modes have been tested, and the worst result recorded was report as below:

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101 kPa	Polarization :	Horizontal
Test Voltage :	DC 3V		
Test Mode :	TX Mode		



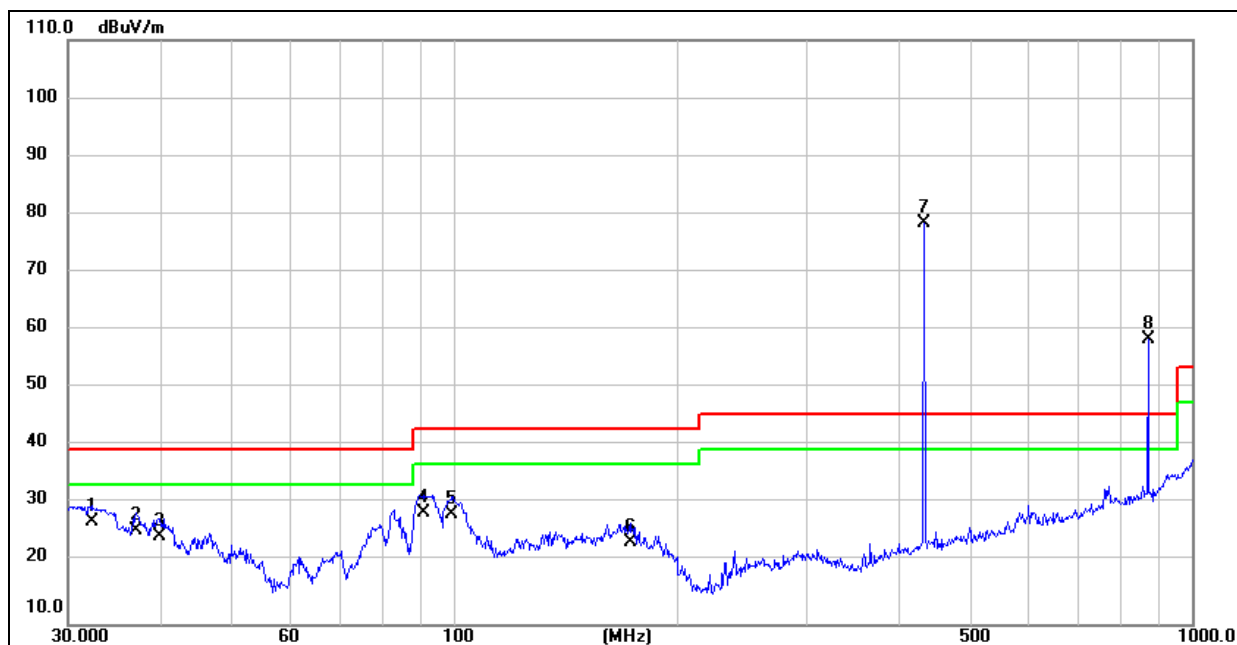
No.	Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark		
1	30.3173	20.77	3.03	23.80	40.00	-16.20	QP		
2	36.7662	23.66	-2.06	21.60	40.00	-18.40	QP		
3	46.6664	25.26	-4.60	20.66	40.00	-19.34	QP		
4	77.5928	29.41	-10.80	18.61	40.00	-21.39	QP		
5	91.4949	31.63	-8.27	23.36	43.50	-20.14	QP		
6	99.5281	30.93	-4.97	25.96	43.50	-17.54	QP		
7	434.0649	79.13	0.04	79.17	100.82	-21.65	peak		
8	868.0832	51.98	7.96	59.94	80.82	-20.88	peak		

Remarks:

1.Measurement Level = Reading level + Correct Factor

2.The emission levels of other frequencies are very lower than the limit and not show in test report.

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101 kPa	Polarization :	Vertical
Test Voltage :	DC 3V		
Test Mode :	TX Mode		



No.	Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark		
1	32.2924	26.78	0.87	27.65	40.00	-12.35	QP		
2	37.1548	28.17	-2.05	26.12	40.00	-13.88	QP		
3	39.9941	27.34	-2.03	25.31	40.00	-14.69	QP		
4	90.8554	37.79	-8.54	29.25	43.50	-14.25	QP		
5	99.5279	33.93	-4.97	28.96	43.50	-14.54	QP		
6	173.2050	30.06	-5.82	24.24	43.50	-19.26	QP		
7	434.0649	78.63	0.04	78.67	100.82	-22.15	peak		
8	868.0832	50.98	7.96	58.94	80.82	-21.88	peak		

Remarks:

1. Measurement Level = Reading level + Correct Factor

2. The emission levels of other frequencies are very lower than the limit and not show in test report.

For average Emission

Frequency MHz	Peak Level dBuV/m	Duty cycle factor	Average Level dBuV/m	Limit AV	Margin	Polarization
433.92	79.17	-7.64	71.53	80.8	-9.27	Horizontal
867.84	59.94	-7.64	52.30	60.8	-8.50	Horizontal

Notes: 1. Average emission Level = Peak Level + Duty cycle factor
2. Duty cycle level please see clause 7.5.

Frequency MHz	Peak Level dBuV/m	Duty cycle factor	Average Level dBuV/m	Limit AV	Margin	Polarization
433.92	78.67	-7.64	71.03	80.8	-9.77	Vertical
867.84	58.94	-7.64	51.30	60.8	-9.50	Vertical

Notes: 1. Average emission Level = Peak Level + Duty cycle factor
2. Duty cycle level please see clause 7.5.

Test Result and Data (Above 1GHz)

Operation Mode: TX Mode

Frequency MHz	Peak Level dBuV/m	Duty cycle factor	Average Level dBuV/m	Limit		Margin dB		Polarization
				PK	AV	PK	AV	
1301.76	50.64	-7.64	43.00	74.00	54.00	-23.36	-11.00	Vertical
1735.68	50.87	-7.64	43.23	80.80	60.80	-29.93	-17.57	Vertical
2169.60	47.06	-7.64	39.42	80.80	60.80	-33.74	-21.38	Vertical
2603.52	47.81	-7.64	40.17	80.80	60.80	-32.99	-20.63	Vertical
3037.44	47.56	-7.64	39.92	80.80	60.80	-33.24	-20.88	Vertical
3905.28	50.95	-7.64	43.31	74.00	54.00	-23.05	-10.69	Vertical
1301.76	49.60	-7.64	41.96	74.00	54.00	-24.40	-12.04	Horizontal
1735.68	50.02	-7.64	42.38	80.80	60.80	-30.78	-18.42	Horizontal
2169.60	48.34	-7.64	40.70	80.80	60.80	-32.46	-20.10	Horizontal
2603.52	48.91	-7.64	41.27	80.80	60.80	-31.89	-19.53	Horizontal
3037.44	50.91	-7.64	43.27	80.80	60.80	-29.89	-17.53	Horizontal
3905.28	48.81	-7.64	41.17	74.00	54.00	-25.19	-12.83	Horizontal

Note: (1) Average emission Level = Peak Level + Duty cycle factor
 (2) Duty cycle level please see clause 7.5.

7.4 CONDUCTED EMISSION TEST

7.4.1 Applicable Standard

According to FCC Part 15.207(a)

7.4.2 Conformance Limit

Conducted Emission Limit		
Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50
Note: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.		

7.4.3 Test Configuration

Test according to clause 7.3 conducted emission test setup

7.4.4 Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

7.4.5 Test Results

N/A

The EUT Powered by 3V Battery

7.5 Calculation of Average Factor

The output field strengths of specification in accordance with the FCC rules specify measurements with an average detector. During the test, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.

The duty cycle is measured in 100 ms or the repetition cycle period, whichever is a shorter time frame. The duty cycle is measured by placing the spectrum analyzer to set zero span at 1MHz resolution bandwidth.

Averaging factor in dB = $20\log(\text{duty cycle})$

The duration of one cycle = 51.48ms

The duty cycle is simply the on-time divided the duration of one cycle

Duty Cycle = $(1.260\text{ms} \times 12 + 0.480\text{ms} \times 13) / 51.48$

= $21.36\text{ms} / 51.48\text{ms}$

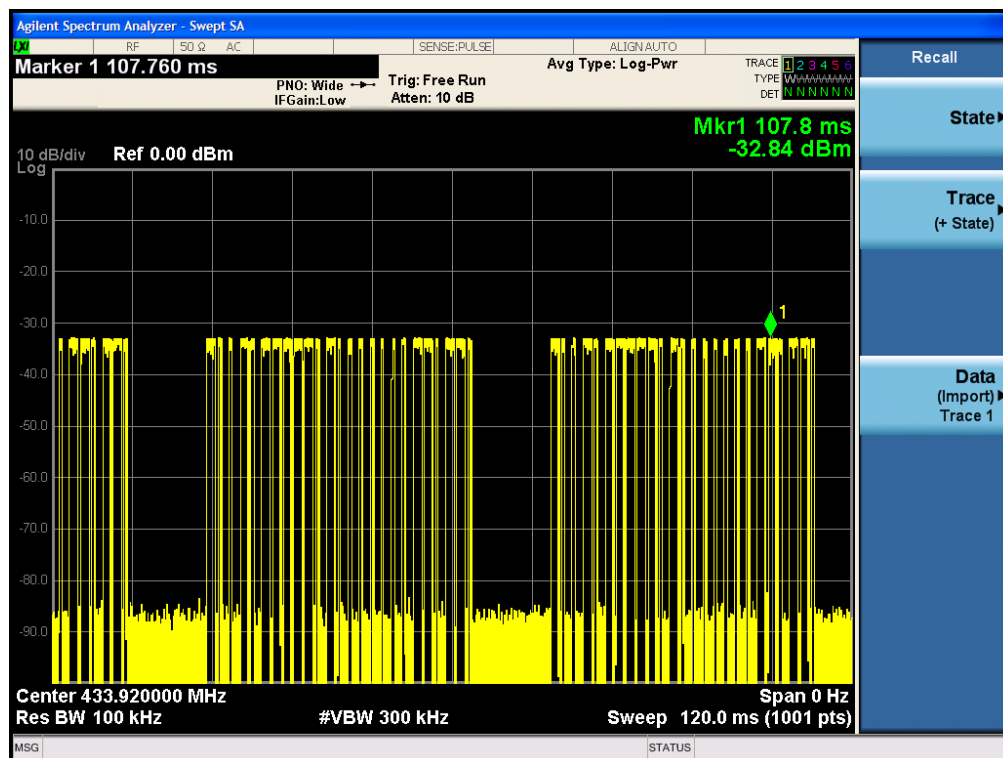
= 0.4149

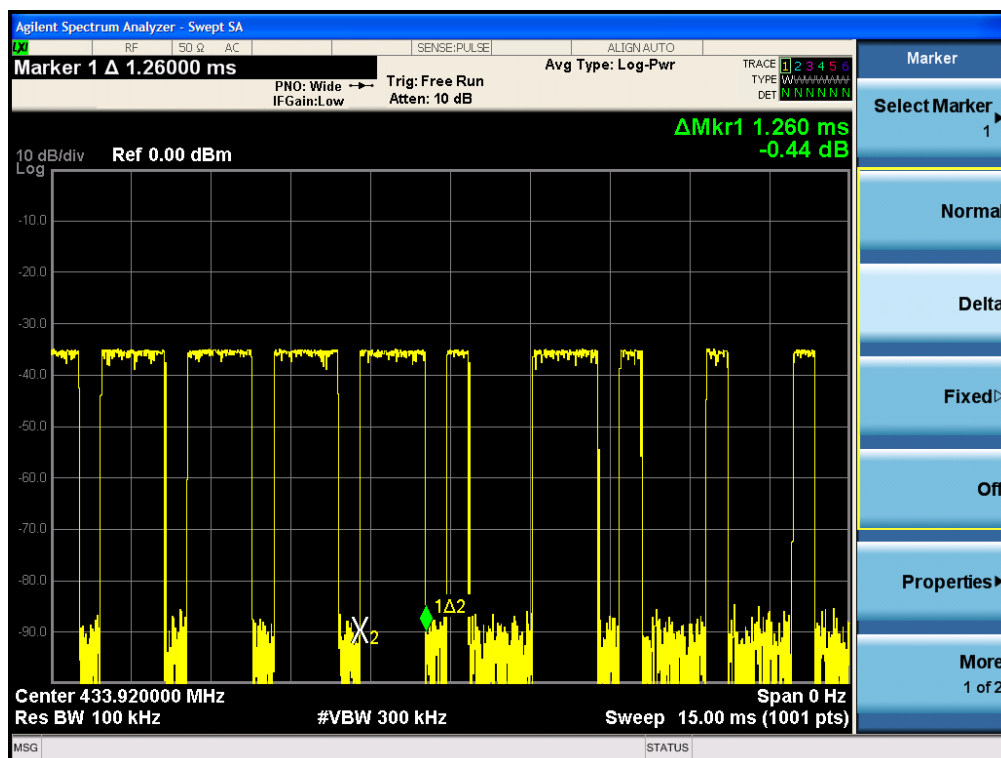
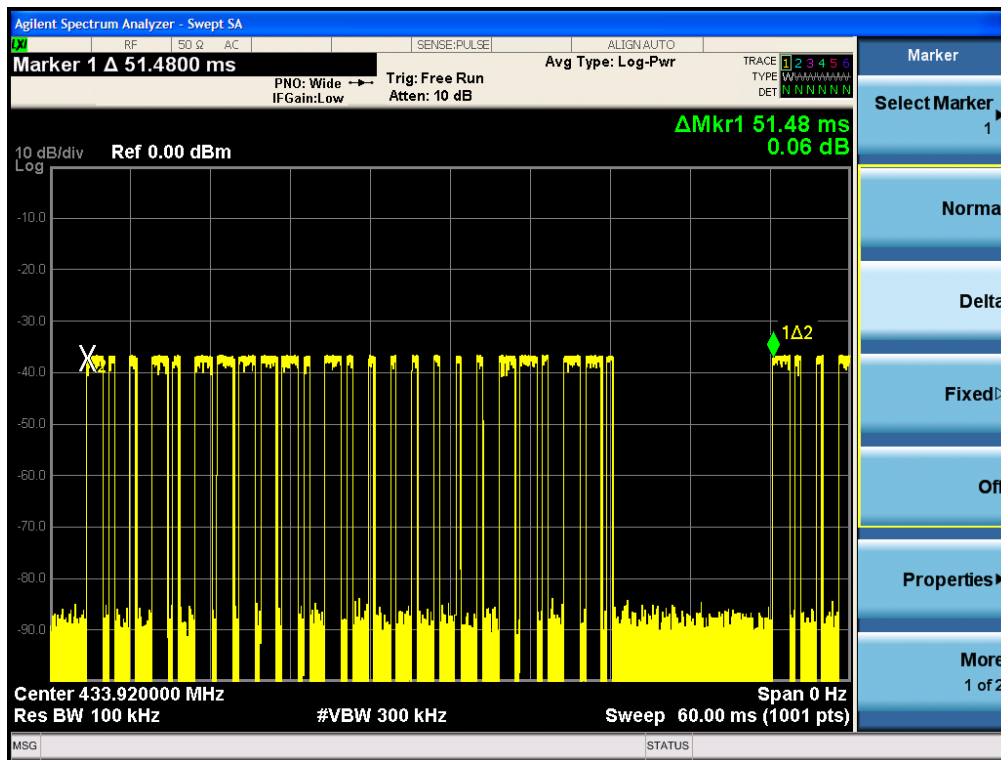
Therefore, the averaging factor is found by $20\log 0.4149 = -7.64 \text{ dB}$

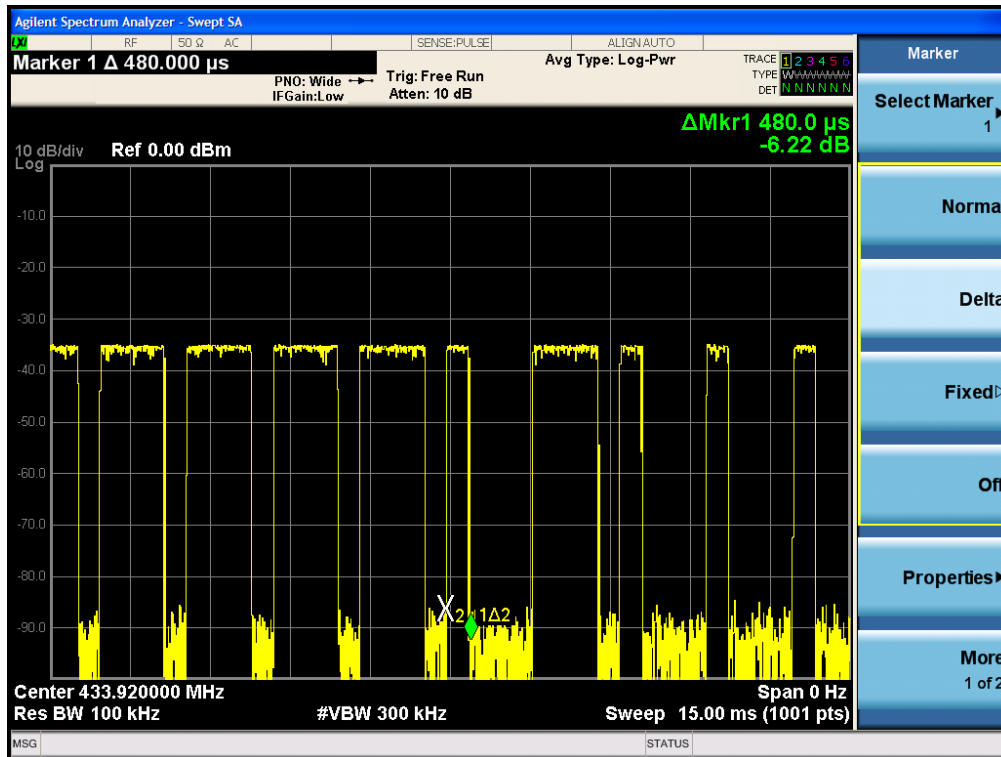
Test plot as follows:

Note: During the 100ms, the amount of pulse and on-time of pulse are the same for every pulse train.

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Voltage :	DC 3V
Test Mode :	TX Mode		







7.6 Antenna Application

7.6.1 Antenna Requirement

Standard	Requirement
FCC CRF Part 15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 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.

7.6.2 Result

PASS.

The EUT has 1 antenna: a PCB Antenna for ASK model, the gain is -0.2 dBi;

Note: ☒ Antenna use a permanently attached antenna which is not replaceable.
☐ Not using a standard antenna jack or electrical connector for antenna replacement
☐ The antenna has to be professionally installed (please provide method of installation)

which in accordance to section 15.203, please refer to the internal photos.

*** End of Report ***

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