



## Test Report

Date : 2024-08-16  
No. : HMD24080004

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**Applicant** : Shenzhen Ztop Technology Co., Ltd.  
203, No. 43 Lixin Road, Danzhutou Community, Nanwan Street,  
Longgang District, Shenzhen

**Supplier / Manufacturer** : Shenzhen Ztop Technology Co., Ltd.  
203, No. 43 Lixin Road, Danzhutou Community, Nanwan Street,  
Longgang District, Shenzhen

**Description of Sample(s)** : Submitted sample(s) said to be  
Product: 433MHz Wireless Remote Control  
Brand Name: N/A  
Model No.: y43302  
FCC ID: 2BCON-Y43302

**Date Samples Received** : 2024-08-07

**Date Tested** : 2024-08-07 to 2024-08-13

**Investigation Requested** : Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI C63.10:2013 for FCC Certification.

**Conclusions** : The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

**Remarks** : ---

**Test by:** Susu

  
Dr.CHAN Kwok Hung, Brian  
Authorized Signatory



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### 1.0 General Details

#### **1.1 Test Laboratory**

The Hong Kong Standards and Testing Centre Ltd.  
EMC Laboratory  
10 Dai Wang Street, Taipo Industrial Estate, New Territories, Hong Kong  
Telephone: 852 2666 1888  
Fax: 852 2664 4353

#### **1.2 Equipment Under Test [EUT]**

##### **Description of Sample(s)**

Product:	433MHz Wireless Remote Control
Manufacturer:	Shenzhen Ztotop Technology Co., Ltd.
	203, No. 43 Lixin Road, Danzhutou Community, Nanwan Street, Longgang District, Shenzhen
Brand Name:	N/A
Model Number:	y43302
Rating:	3.0Vd.c. ("AAA battery × 2)

#### **1.2.1 Description of EUT Operation**

The Equipment Under Test (EUT) is a 433MHz Remote Control. The EUT is operating at 433.92 MHz.  
Test was conducted under Tx mode.

RF modulation: FSK

#### **1.3 Date of Order**

2024-08-05

#### **1.4 Submitted Sample(s):**

1 Sample

#### **1.5 Test Duration**

2024-08-07 to 2024-08-13

#### **1.6 Country of Origin**

China

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### 2.0 Technical Details

#### 2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal

Regulations] Part 15 and ANSI C63.10: 2013 for FCC Certification.

This is a manually operated transmitter, Press the button to start sending signals.

#### 2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.231(a)	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20dB Bandwidth of Fundamental Emission	FCC 47CFR 15.231(c)	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manual Operated Transmitter Transmission Time	FCC 47CFR 15.231(a)	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

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### **3.0 Test Results**

#### **3.1 Emission**

##### **3.1.1 Radiated Emissions**

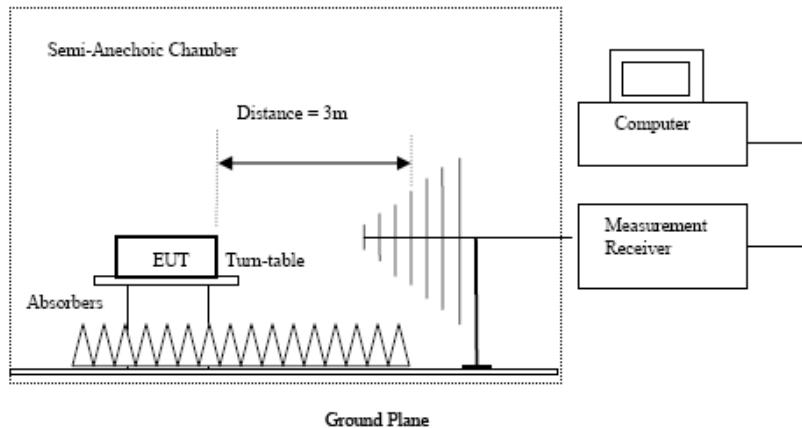
Test Requirement:	FCC 47CFR 15.231(a)		
Test Method:	ANSI C63.10:2013		
Test Date:	2024-08-08		
Mode of Operation:	Tx mode		
Ambient Temperature: 25°C	Relative Humidity: 52%	Atmospheric Pressure: 101 kPa	

#### **Test Method:**

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber\*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber\*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

\* Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with Registration Number: HK0001  
 Test Firm Registration Number: 367672

#### **Test Setup:**



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used, 9kHz to 30MHz loop antennas are used.



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### Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.231a]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Average] [ $\mu$ V/m]	Field Strength of Spurious Emission [Average] [ $\mu$ V/m]
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,750 *	125 to 375 *
174-260	3,750	375
260-470	3,750 to 12,500 *	375 to 1,250 *
Above 470	12,500	1,250

<sup>1</sup>Linear interpolations.

The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

### Results of Tx mode(1GHz – 18GHz): PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
433.92	45.1	15.4	60.5	1059.3	109,647.8	Vertical
433.92	55.4	15.3	70.7	3427.7	109,647.8	Horizontal

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
867.84	21.3	22.8	44.1	160.9	10,964.78	Vertical
867.84	29.2	22.5	51.7	385.0	10,964.78	Horizontal
1301.76	12.4	26.8	39.2	91.2	5,011.87	Vertical
1301.76	12.5	26.8	39.3	92.3	5,011.87	Horizontal
1735.68	9.6	32.9	42.5	133.4	10,964.78	Vertical
1735.68	10.4	32.7	43.1	142.9	10,964.78	Horizontal
2169.60	4.6	38.2	42.8	138.0	10,964.78	Vertical
2169.60	5.1	38.1	43.2	144.5	10,964.78	Horizontal

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Results of Tx mode(1GHz – 18GHz): PASS

Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Peak Value Level @3m dB $\mu$ V	Duty Cycle Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
433.92	60.5	-7.7	52.8	436.5	10,964.78	Vertical
433.92	70.7	-7.7	63.0	1412.5	10,964.78	Horizontal

Field Strength of Spurious Emissions						
Average Value						
Frequency MHz	Peak Value Level @3m dB $\mu$ V	Duty Cycle Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
867.84	44.1	-7.7	36.4	66.3	1,096.480	Vertical
867.84	51.7	-7.7	44.0	158.7	1,096.480	Horizontal
1301.76	39.2	-7.7	31.5	37.6	501.190	Vertical
1301.76	39.3	-7.7	31.6	38.0	501.190	Horizontal
1735.68	42.5	-7.7	34.8	55.0	1,096.480	Vertical
1735.68	43.1	-7.7	35.4	58.9	1,096.480	Horizontal
2169.60	42.8	-7.7	35.1	56.9	1,096.480	Vertical
2169.60	43.2	-7.7	35.5	59.6	1,096.480	Horizontal

Remarks:

FCC Limit for Fundamental Average Measurement =  $41.67(433.92)-7083=10964.78\mu$ V/m

+: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 were not adjusted for averaging and the limits of FCC Rules Part 15 Section 15.209 were applied.

\*: Adjusted by Duty Cycle = -20.0dB

Duty Cycle Correction = -20.0dB

Correction Factor= Cable loss Factor+ Ant Factor-Amp Factor

Average Value Final Field Strengted = Peak Value Final Field Strengted +Duty Cycle

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty (9kHz-30MHz): 2.0dB

(30MHz -1GHz): 4.9dB

(1GHz -6GHz): 4.02dB

(6GHz -26.5GHz): 4.03dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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### Limits for Radiated Emissions FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [ $\mu$ V/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

#### Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty: (9kHz-30MHz): 2.0dB

(30MHz -1GHz): 4.9dB

(1GHz -6GHz): 4.02dB

(6GHz -26.5GHz): 4.03dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

#### Result of Tx mode (9kHz - 30MHz): PASS

Emissions detected are more than 20 dB below the limit line(s).

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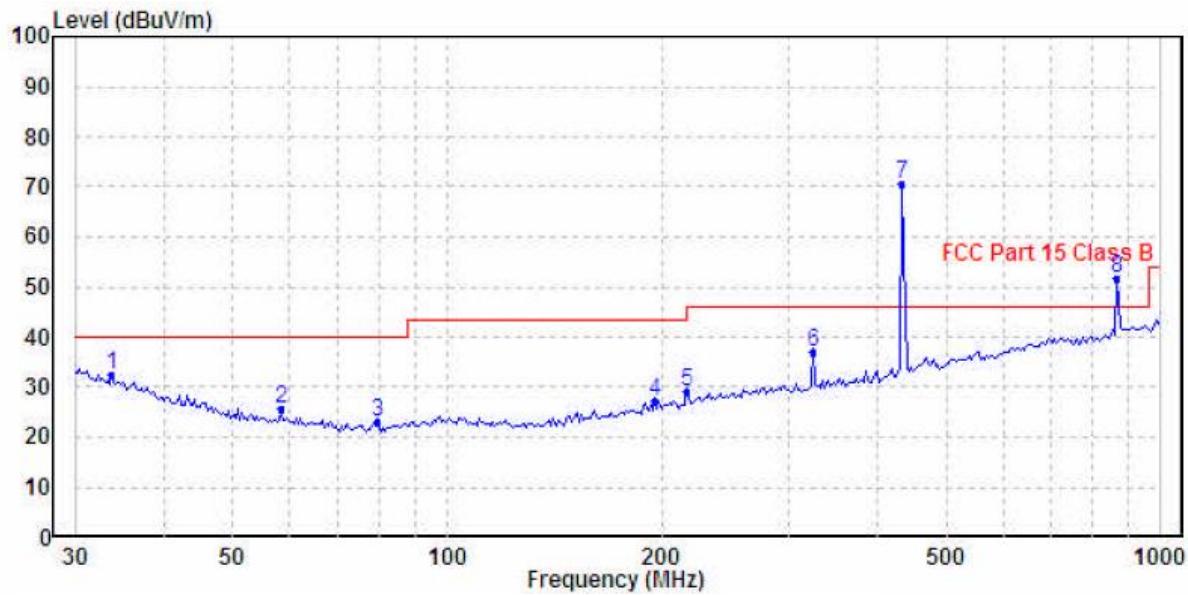
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Results of Tx mode (30MHz – 1GHz): PASS

Horizontal



Ambient Temperature: 26.3C

Relative Humidity : 54.7%

Air Pressure : 100.9kPa

Freq	Level	Limit	Over	Remark	Pol/Phase
		Line	Limit		
1	33.799	32.40	40.00	-7.60 QP	Horizontal
2	58.407	25.69	40.00	-14.31 QP	Horizontal
3	79.521	23.00	40.00	-17.00 QP	Horizontal
4	195.137	27.18	43.50	-16.32 QP	Horizontal
5	216.783	28.88	46.00	-17.12 QP	Horizontal
6	325.596	37.07	46.00	-8.93 QP	Horizontal
7	433.920	70.67			
8	867.840	51.71			

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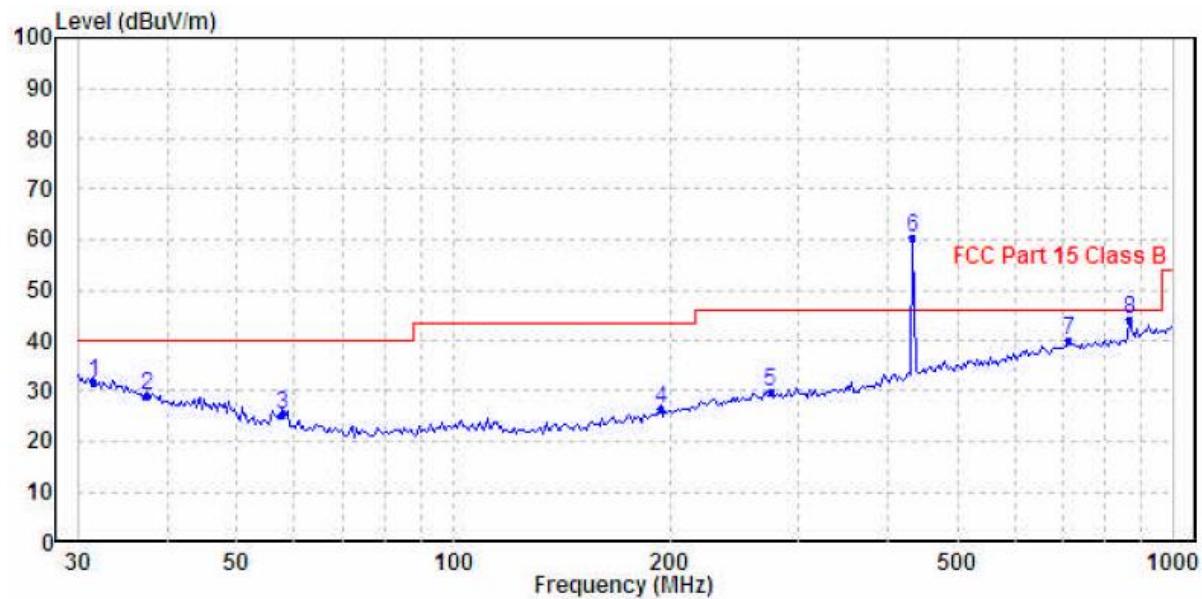


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Vertical



Ambient Temperature: 26.3°C  
Relative Humidity : 54.7%  
Air Pressure : 100.9kPa

Freq	Level	Limit		Over Limit	Remark	Pol/Phase
		MHz	dBuV/m	MHz	dBuV/m	
1	31.510	31.87	40.00	-8.13	QP	Vertical
2	37.548	28.91	40.00	-11.09	QP	Vertical
3	57.594	25.45	40.00	-14.55	QP	Vertical
4	193.773	26.56	43.50	-16.94	QP	Vertical
5	275.157	29.68	46.00	-16.32	QP	Vertical
6	433.920	60.45				
7	714.173	40.18	46.00	-5.82	QP	Vertical
8	867.840	44.13				



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### 3.1.2 Antenna Requirement

Ambient Temperature: 25°C      Relative Humidity: 51%      Atmospheric Pressure: 101 kPa

#### Test Requirements: § 15.203

#### Test Specification:

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.

#### Test Results:

This is PCB antenna. There is no external antenna, the antenna gain = 0dBi. User is unable to remove or changed the Antenna.

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### 3.2 20dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.231(c)

Test Method: ANSI C63.10:2013

Test Date: 2024-08-07

Mode of Operation: Tx mode

Ambient Temperature: 25°C

Relative Humidity: 52%

Atmospheric Pressure: 101 kPa

#### **Test Method:**

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

#### **Test Setup:**

As Test Setup of clause 3.1.1 in this test report.

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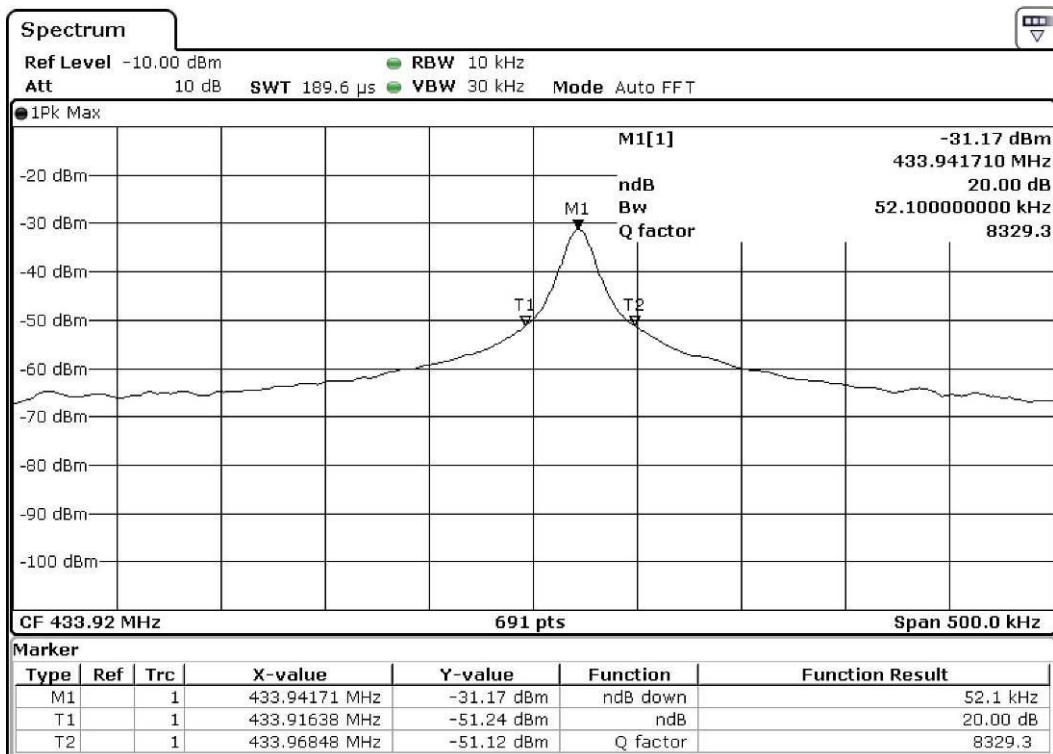
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### Limits for 20 dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [kHz]	FCC Limits * [MHz]
433.92	226.48335	1.0848

\*: FCC Limit for Bandwidth measurement  
= (0.25%)(Center Frequency)  
= (0.0025)(433.92)  
= 1.0848MHz

### 20dB Bandwidth of Fundamental Emission



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### Appendix A

#### List of Measurement Equipment

#### Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3	--	2024-04-18	2029-04-18
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A
EM293	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	N9020A	MY50510152	2023-03-21	2025-03-21
EM299	BROADBAND HORN ANTENNA	ETS-LINDGREN	3115	00114120	2023-01-25	2025-01-25
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2023-01-16	2025-01-16
EM301	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-10	00130988	2023-02-15	2025-02-15
EM353	LOOP ANTENNA	ETS-LINDGREN	6502	00206533	2022-09-26	2024-09-26
EM355	BICONILOG ANTENNA	ETS-LINDGREN	3143B	00094856	2022-08-26	2024-08-26
EM200	DUAL CHANNEL POWER METER	R & S	NRVD	100592	2023-08-02	2025-08-02
EM012	PRE-AMPLIFIER	HP	HP8448B	3008A00262	2022-11-08	2025-11-08

#### Remarks:-

CM      Corrective Maintenance

N/A      Not Applicable

TBD      To Be Determined

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### Appendix B

#### Duty Cycle Correction During 100msec

Each packet period (100msec) never exceeds a series of 109 (106\*0.3478 ms+4\*1.1014ms) pulses. Assuming any combination of pulses may be obtained due to encoding the worst case transmit duty cycle would be considered  
(106\*0.3478 ms+4\*1.1014ms) per 100msec = 41.2724% duty cycle.

Remarks:

Duty cycle factor = 20Log [41.2724/100] = -7.7dB

The following figures [Figure A to Figure C] showed the characteristics of the pulse train for one of these functions.

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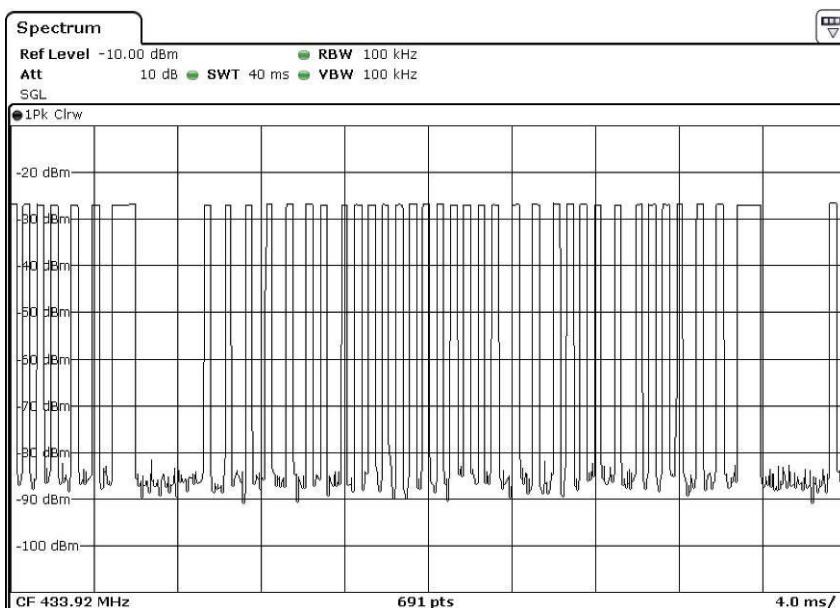
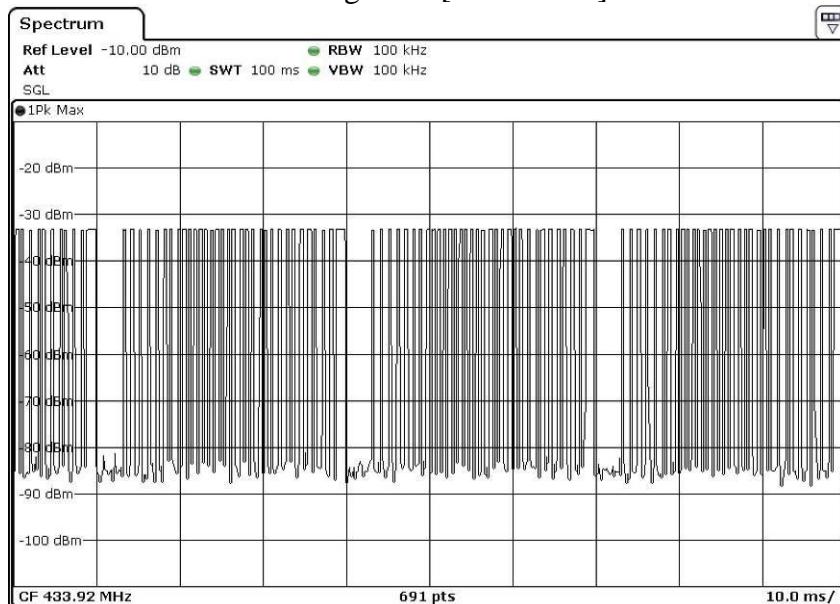


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Figure A [Pulse Train]



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Figure B [ Pulse]

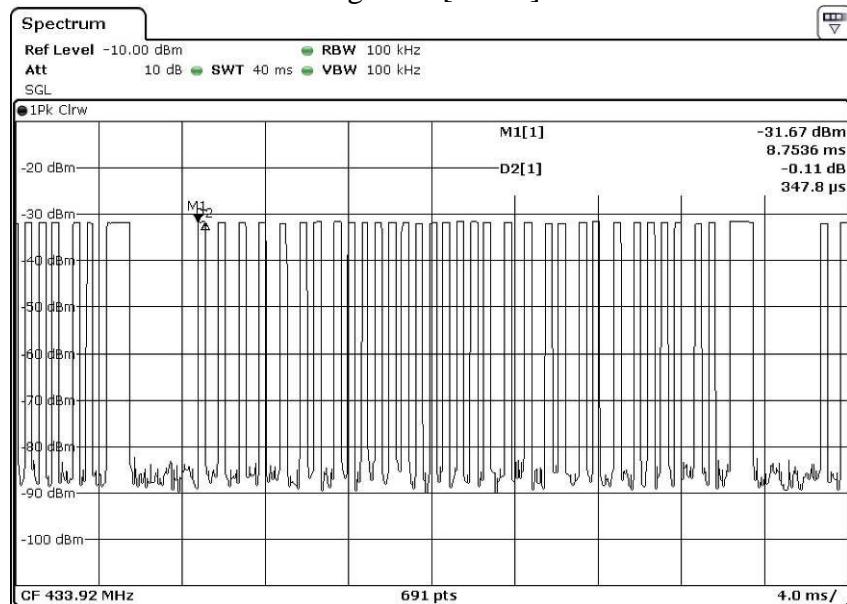
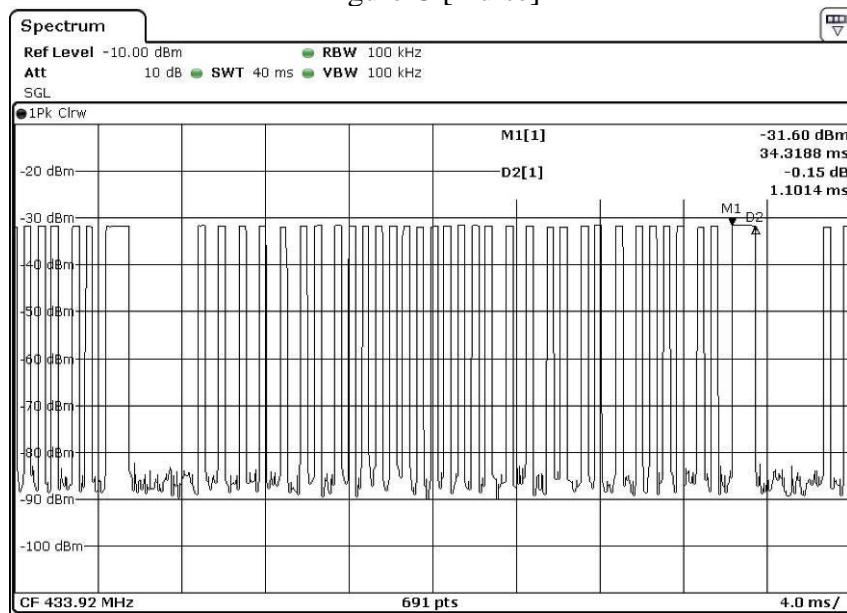


Figure C [ Pulse]



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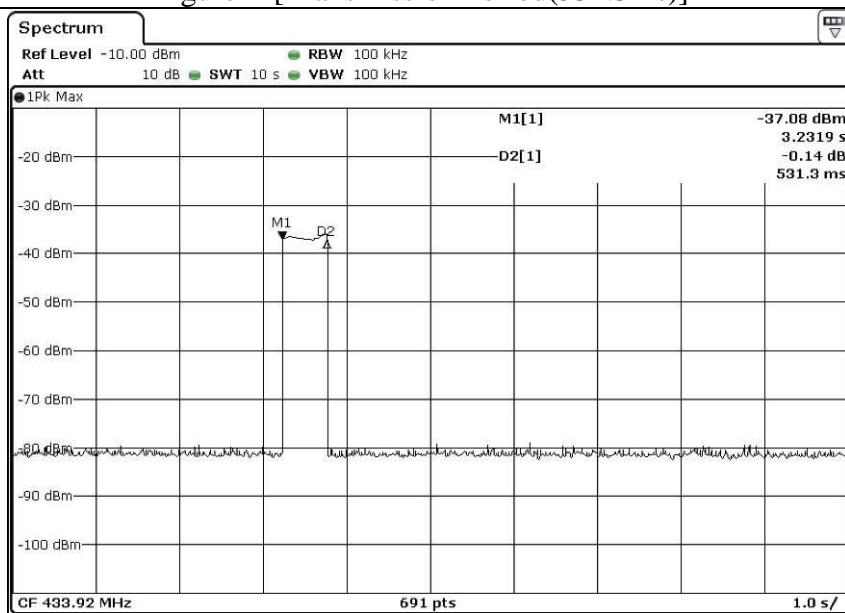
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### Appendix C

#### Manual Operated Transmitter Transmission Time [FCC 47CFR 15.231(a)]

According to FCC 47CFR15.231 (a). A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. The EUT ceases transmission almost immediately upon being released and appears to finish the current packet being transmitted. Therefore the longest period of time the transmitter should take to deactivate is a packet length.

Figure E [Transmission Period(531.3ms)]



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### Appendix D

#### Photographs of EUT

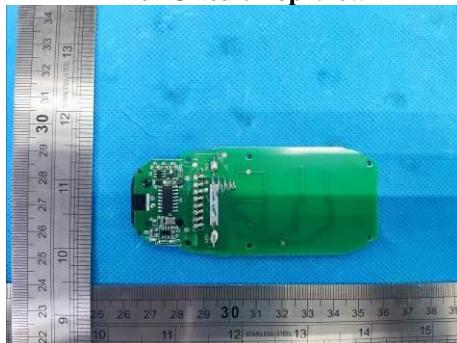
Front View of the product



Inner Circuit Top View



Inner Circuit Top View



Rear View of the product



Inner Circuit Bottom View



Inner Circuit Bottom View



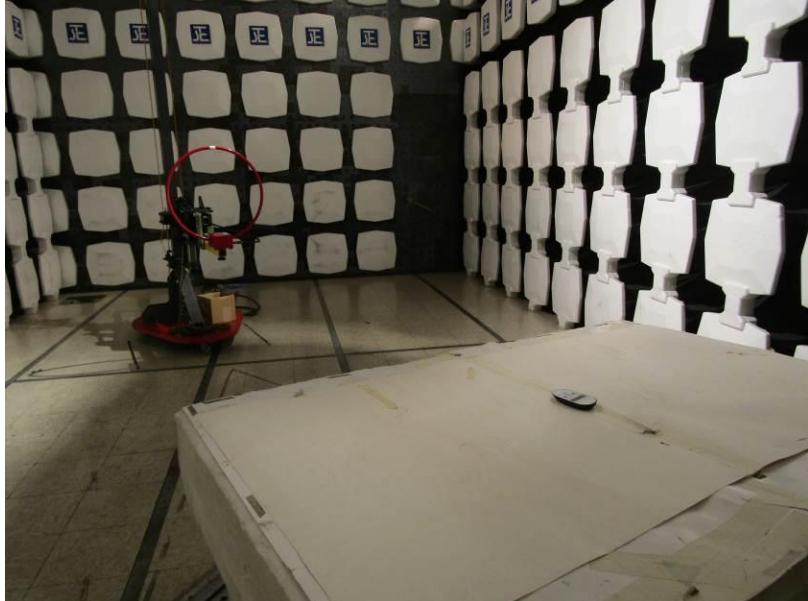
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Date : 2024-08-16  
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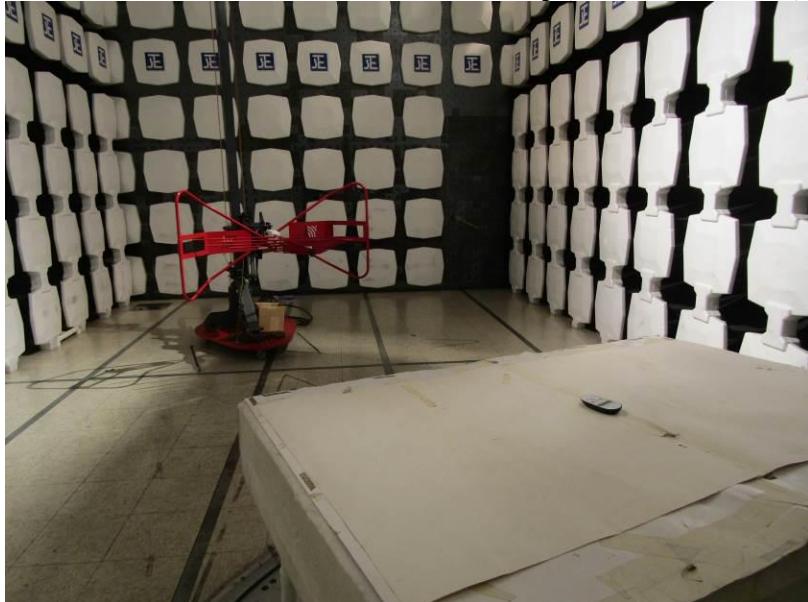
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### Photographs of EUT

**Measurement of Radiated Emission Test Set Up (9kHz – 30MHz)**



**Measurement of Radiated Emission Test Set Up (30MHz – 1000MHz)**



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### Photographs of EUT



\*\*\*\*\* End of Test Report \*\*\*\*\*

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