

FCC REPORT

Applicant: PORTMAN ELECTRONICS (DONGGUAN) CO., LTD.

Address of Applicant: NO#10, Luyi 2 Road, Keyuancheng, Tangxia Town,
DONGGUAN CITY, GUANGDONG PROVINCE CHINA
523718

Equipment Under Test (EUT)

Product Name: CAR ALARM

Model No.: 91Z

FCC ID: TBQ91Z-AM1W

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.231

Date of sample receipt: 15 Nov., 2019

Date of Test: 16 Nov., to 09 Dec., 2019

Date of report issue: 10 Dec., 2019

Test Result: PASS*

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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2 Version

Version No.	Date	Description
00	10 Dec., 2019	Original

Prepared By:



Date:

10 Dec., 2019

Test Engineer

Check By:



Date:

10 Dec., 2019

Project Engineer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
Field strength of the fundamental signal	15.231 (b)	Pass
Spurious emissions	15.231 (b)/15.209	Pass
20dB Bandwidth	15.231 (c)	Pass
Duration Time	15.231 (a)(1)	Pass
Conducted Emission	15.207	N/A

Remarks:
N/A: The EUT not applicable of the test item.
Pass: The EUT complies with the essential requirements in the standard.
TEST ACCORDING TO ANSI C63.4:2014 AND ANSI C63.10:2013.

5 General Information

5.1 Client Information

Applicant:	PORTMAN ELECTRONICS (DONGGUAN) CO., LTD.
Address:	NO#10, Luyi 2 Road, Keyuancheng, Tangxia Town, DONGGUAN CITY, GUANGDONG PROVINCE CHINA 523718
Manufacturer/ Factory:	PORTMAN ELECTRONICS (DONGGUAN) CO., LTD.
Address:	NO#10, Luyi 2 Road, Keyuancheng, Tangxia Town, DONGGUAN CITY, GUANGDONG PROVINCE CHINA 523718

5.2 General Description of E.U.T.

Product Name:	CAR ALARM
Model No.:	91Z
Operation Frequency:	433.92MHz
Channel numbers:	1
Modulation type:	ASK
Antenna Type:	Helix Antenna
Antenna gain:	-1.25 dBi
Power supply:	DC 6V (CR2016 battery *2)
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

5.3 Test mode

Transmitting mode:	Keep the EUT in transmitting mode with modulation (new battery used)					
Pre-Test Mode:						
CCIS has verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:						
Axis	X	Y	Z			
Field Strength(dBuV/m)	88.64	85.13	86.47			
Final Test Mode:						
According to ANSI C63.4 standards, the test results are both the "worst case" and "worst setup": X axis (see the test setup photo)						

5.4 Description of Support Units

N/A

5.5 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC - Designation No.: CN1211**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

● **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

● **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

5.6 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,

Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

5.7 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Emission (9kHz ~ 30MHz)	±1.60 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.38 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±3.36 dB (k=2)

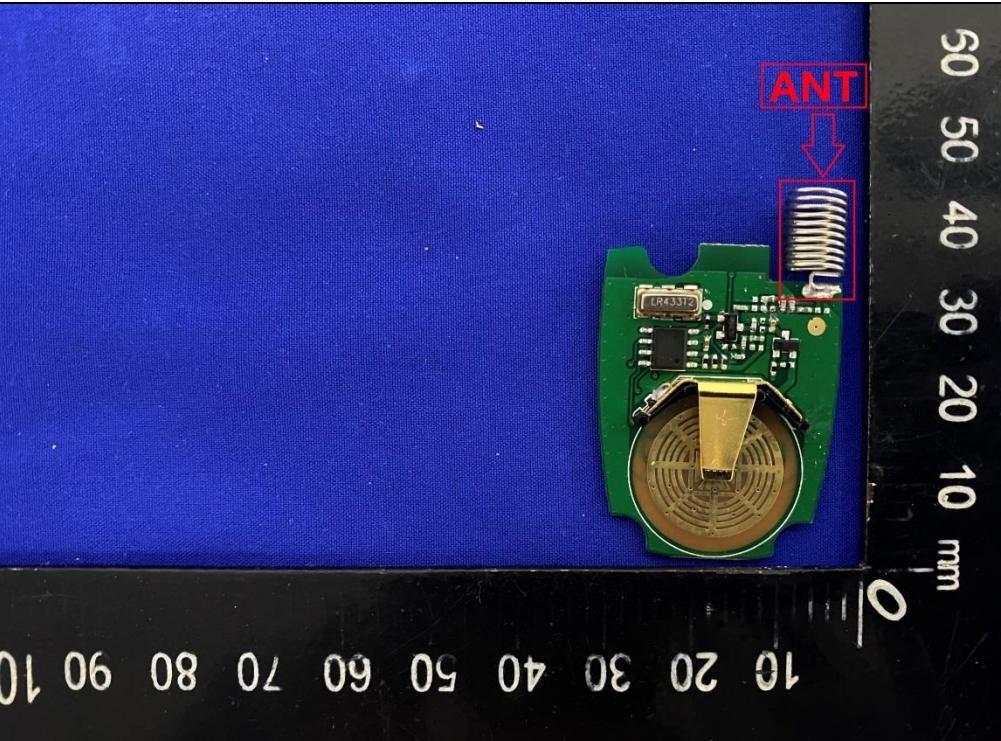
5.8 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-18-2019	03-17-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-18-2019	03-17-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-21-2018	11-20-2019
				11-21-2019	11-20-2020
Loop Antenna	SCHWARZBECK	FMZB 1519 B	00044	03-18-2019	03-17-2020
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-18-2019	03-17-2020
Pre-amplifier	CD	PAP-1G18	11804	03-18-2019	03-17-2020
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-18-2019	03-17-2020
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-21-2018	11-20-2019
				11-21-2019	11-20-2020
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-18-2019	03-17-2020
Simulated Station	Anritsu	MT8820C	6201026545	03-18-2019	03-17-2020
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-18-2019	03-17-2020
Cable	MICRO-COAX	MFR64639	K10742-5	03-18-2019	03-17-2020
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-18-2019	03-17-2020
Temperature Humidity Chamber	HengPu	HPGDS-500	20140828008	09-24-2019	09-23-2020

6 Test results and Measurement Data

6.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: 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, 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.	
E.U.T Antenna:	The EUT make use of an Helix antenna, The typical gain of the antenna is -1.25 dBi.



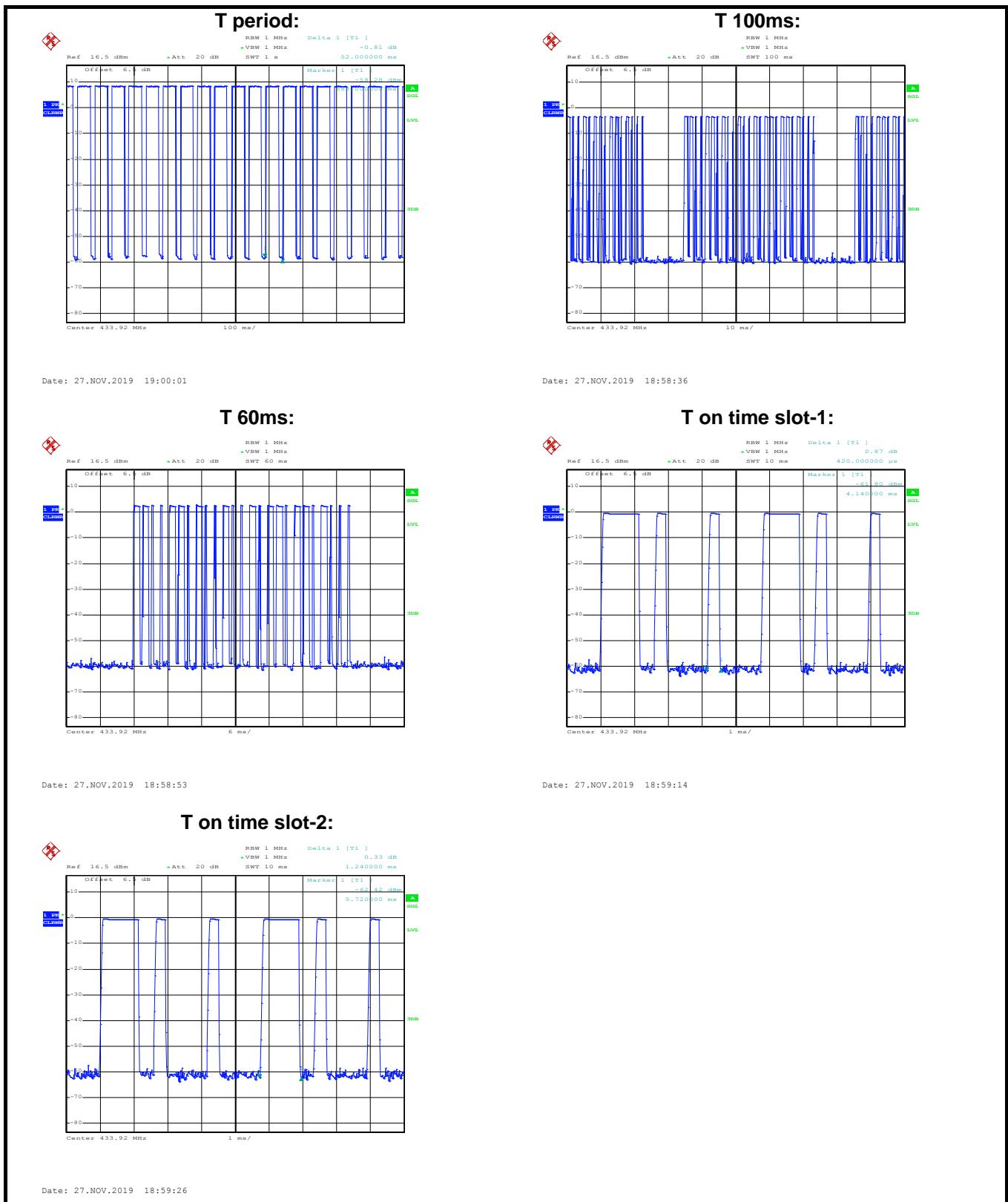
6.2 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.231(a) and 15.209					
Test Method:	ANSI C63.4:2014					
Test Frequency Range:	30MHz to 5000MHz					
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)					
Receiver setup:	Frequency	Detector	RBW	VBW		
	30MHz-1GHz	Quasi-peak	120kHz	300kHz		
	Above 1GHz	Peak	1MHz	3MHz		
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark		
	433.92MHz	80.83		Average Value		
		100.83		Peak Value		
Limit: (Spurious Emissions)	Frequency	Limit (dBuV/m @3m)		Remark		
	30MHz-88MHz	40.0		Quasi-peak Value		
	88MHz-216MHz	43.5		Quasi-peak Value		
	216MHz-960MHz	46.0		Quasi-peak Value		
	960MHz-1GHz	54.0		Quasi-peak Value		
	Above 1GHz	54.0		Average Value		
		74.0		Peak Value		
Or The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level whichever limit permits higher field strength.						
Test Procedure:	<ol style="list-style-type: none"> The EUT was placed on the top of a rotating table 0.8m(below 1GHz) /1.5m(above 1GHz) above the ground at a 3 meter chamber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. The antenna height 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. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. 					

Test setup:	<p>Below 1GHz</p> <p>Above 1GHz</p>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

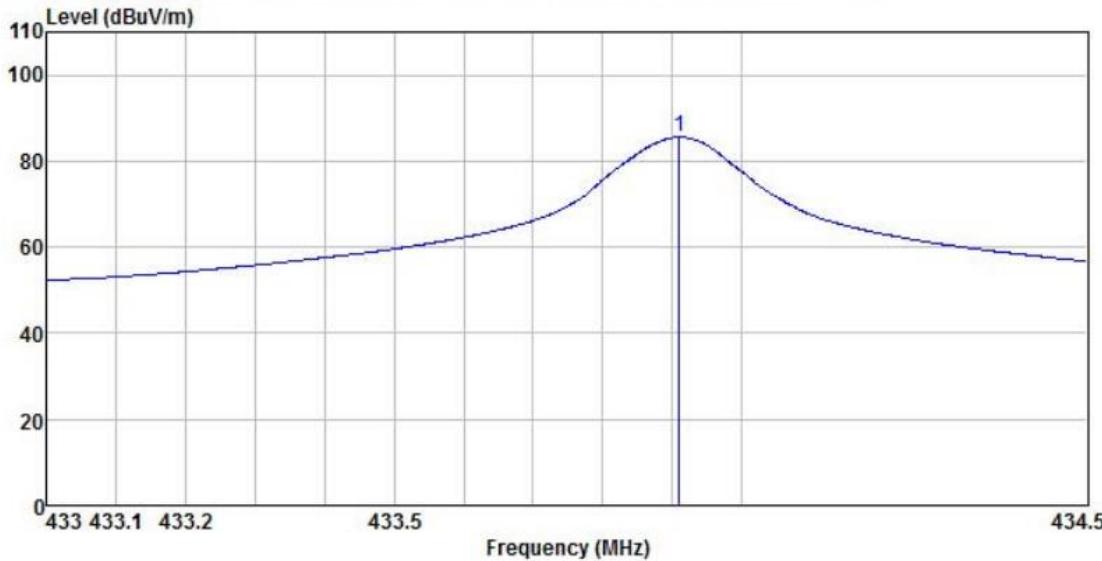
6.2.1 Field Strength Of The Fundamental Signal

Peak value										
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		
433.92	66.28	16.11	3.16	0.00	85.55	100.83	-15.28	Vertical		
433.92	69.37	16.11	3.16	0.00	88.64	100.83	-12.19	Horizontal		
Average value										
Frequency (MHz)	Level (dBuV/m)		Duty Cycle factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
433.92	85.55		-8.15	77.40	80.83	-3.43	Vertical			
433.92	88.64		-8.15	80.49	80.83	-0.34	Horizontal			
Calculate Formula:		Average value=Peak value + Duty Cycle Factor								
		Duty cycle factor = $20\log(\text{Duty cycle})$								
		Duty cycle = on time/100 milliseconds or period, whichever is less								
Test data:		T on time =20.34(ms)								
		T period =52(ms)<100(ms)								
		Duty cycle =39.12%								
		Duty cycle factor = $20\log(\text{Duty cycle}) = -8.15$								
Remark		T on time= $T_1 \times 13 + T_2 \times 12 = 0.42 \times 13 + 1.24 \times 12 = 20.34\text{ms}$								



Test Plots:

Product Name:	CAR ALARM	Product Model:	91Z
Test By:	Yaro	Test mode:	Tx mode
Test Frequency:	433.92 MHz	Polarization:	Vertical
Test Voltage:	DC 6V	Environment:	Temp: 24°C Huni: 57%

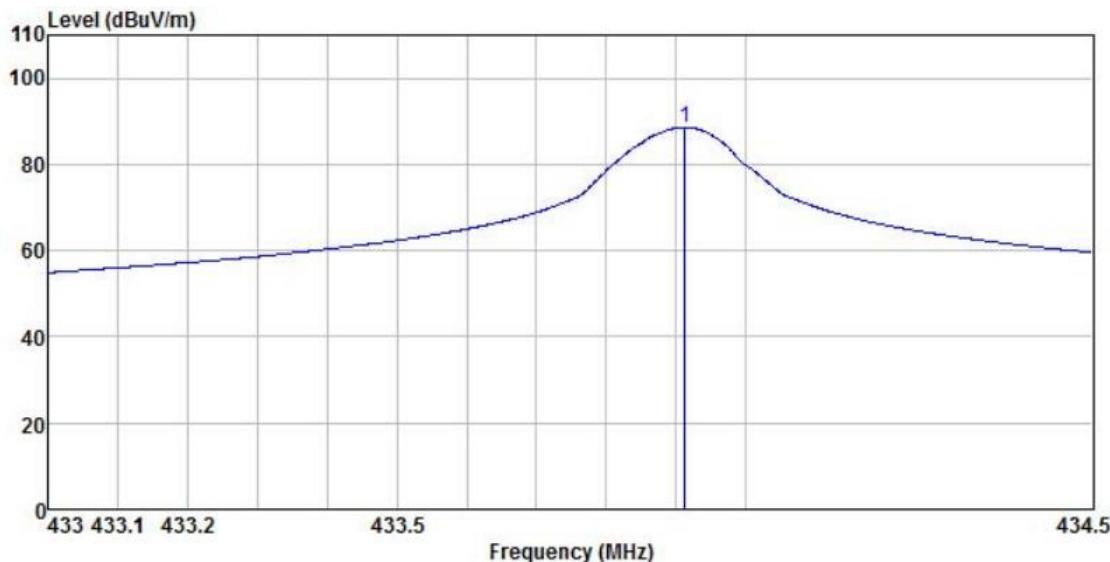


Freq	Read Level MHz	Antenna Factor	Cable Loss dB	Preamp Factor	Line Level dB	Limit Line dBuV/m	Over Line dBuV/m	Over Limit dB	Remark
1	433.911	66.28	16.11	3.16	0.00	85.55	-----	-----	

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

Product Name:	CAR ALARM	Product Model:	91Z
Test By:	Yaro	Test mode:	Tx mode
Test Frequency:	433.92 MHz	Polarization:	Horizontal
Test Voltage:	DC 6V	Environment:	Temp: 24°C Huni: 57%



Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Line Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	433.913	69.37	16.11	3.16	0.00	88.64	-----	-----

Remark:

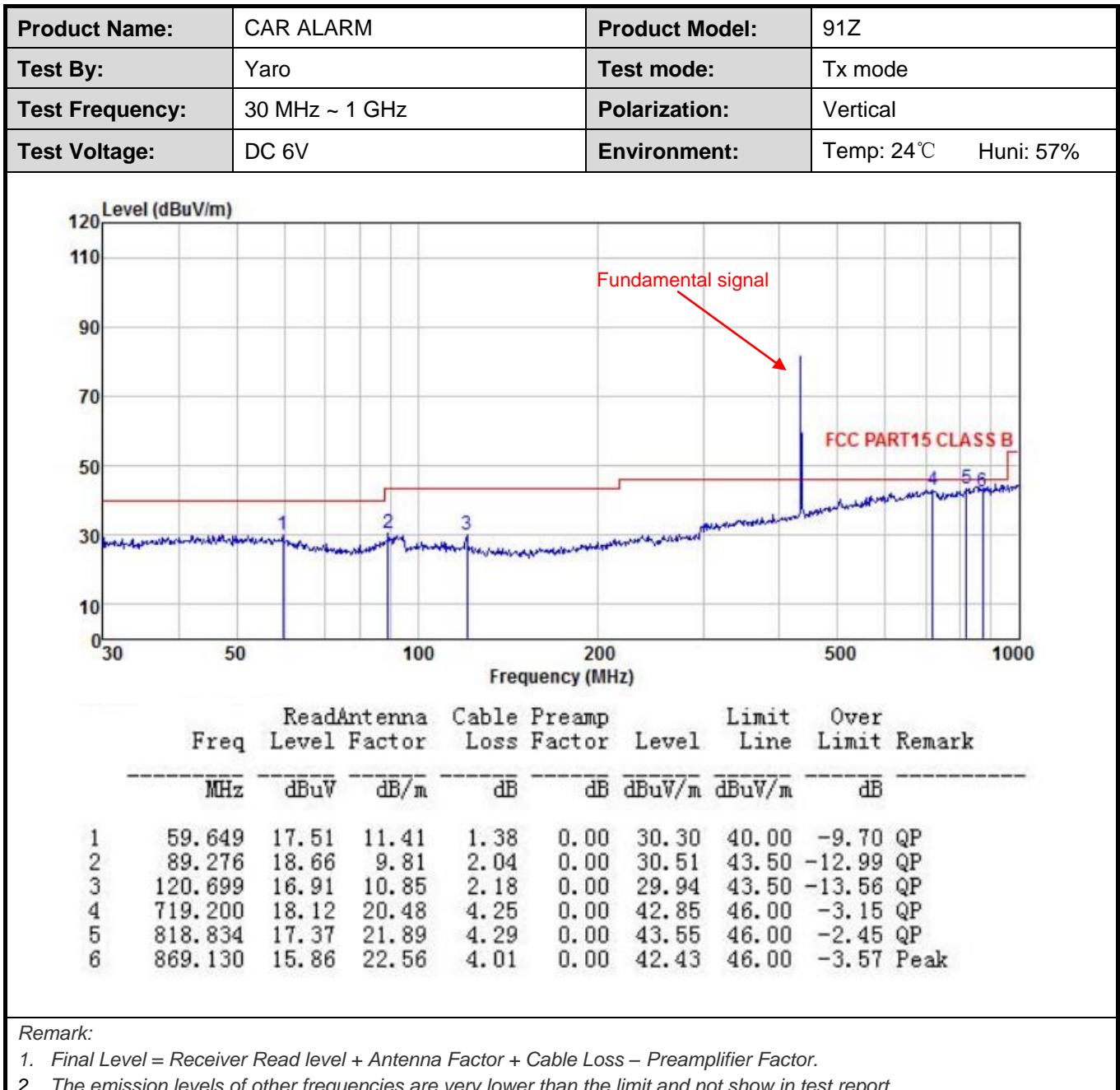
- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

6.2.2 Spurious Emissions

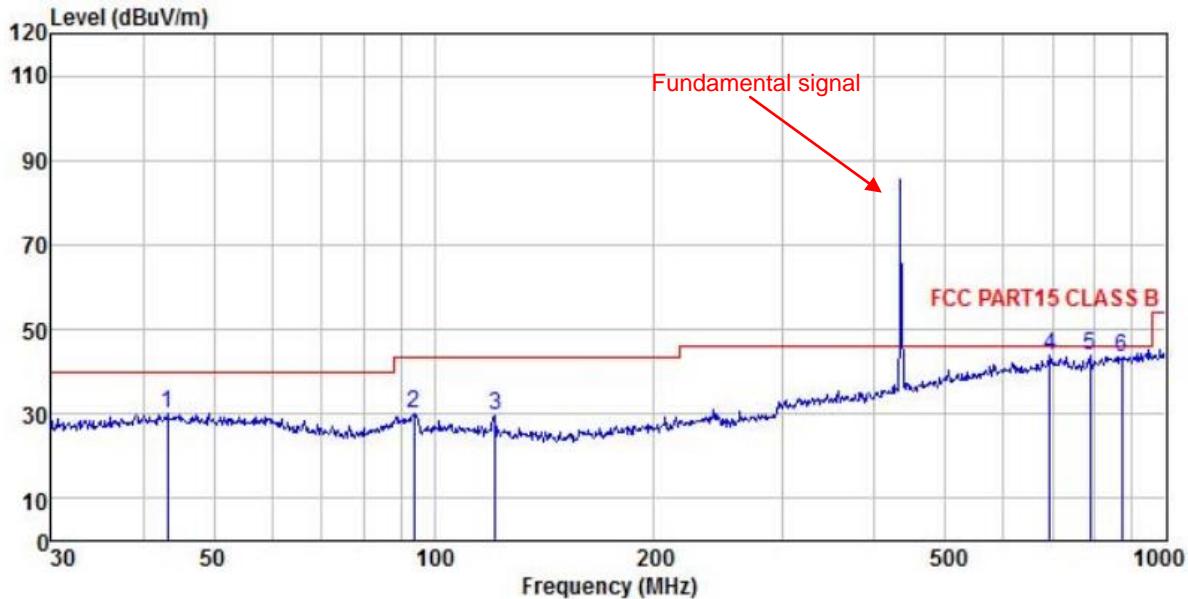
Below 1GHz (30MHz-1000MHz)								
peak value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
869.13	15.86	22.56	4.01	0.00	42.43	80.83	-38.40	Vertical
869.13	16.99	22.56	4.01	0.00	43.56	80.83	-37.27	Horizontoal

Average value						
Frequency (MHz)	Level (dBuV/m)	Duty Cycle factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
869.13	42.43	-8.15	34.28	60.83	-26.55	Vertical
869.13	43.56	-8.15	35.41	60.83	-25.42	Horizontal

Test Plots:



Product Name:	CAR ALARM	Product Model:	91Z
Test By:	Yaro	Test mode:	Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	DC 6V	Environment:	Temp: 24°C Huni: 57%

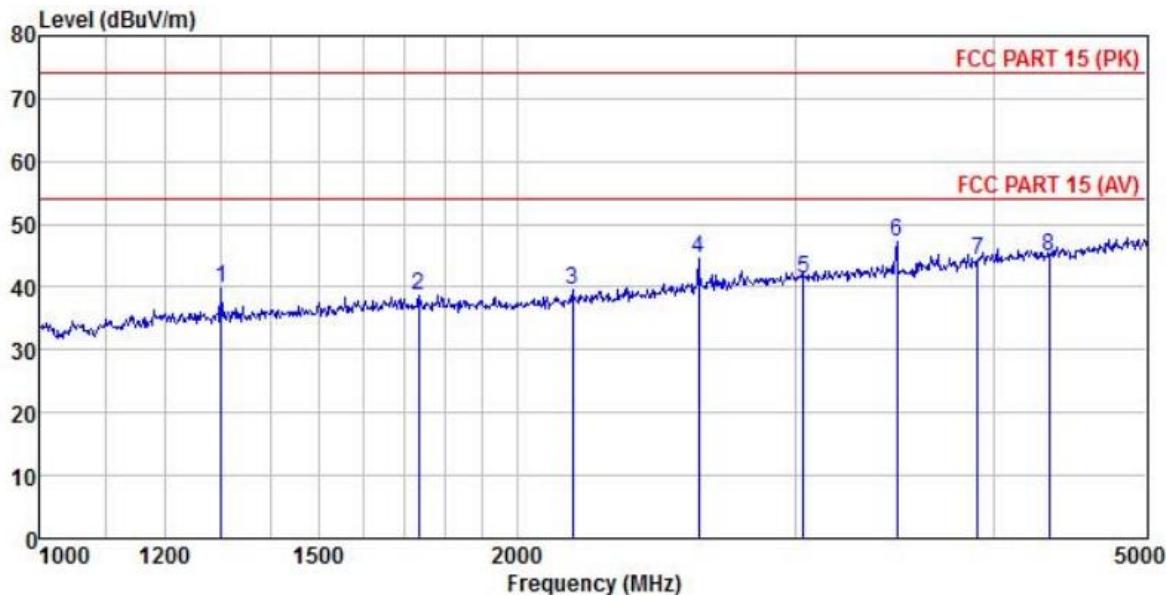


Freq MHz	Read Level dBuV	Antenna Factor	Cable Loss dB	Preamp Factor	Limit Level dBuV/m		Over Line dB	Over Limit dB	Remark
	MHz	dB/m	dB	dB	dBuV/m	dBuV/m			
1	43.202	16.40	12.34	1.26	0.00	30.00	40.00	-10.00	QP
2	93.768	16.92	10.98	2.02	0.00	29.92	43.50	-13.58	QP
3	121.123	16.64	10.81	2.18	0.00	29.63	43.50	-13.87	QP
4	694.417	19.50	20.32	4.14	0.00	43.96	46.00	-2.04	QP
5	787.851	18.42	21.27	4.35	0.00	44.04	46.00	-1.96	QP
6	869.130	16.99	22.56	4.01	0.00	43.56	46.00	-2.44	Peak

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product Name:	CAR ALARM	Product Model:	91Z
Test By:	Yaro	Test mode:	Tx mode
Test Frequency:	1 GHz ~ 5 GHz	Polarization:	Vertical
Test Voltage:	DC 6V	Environment:	Temp: 24°C Huni: 57%

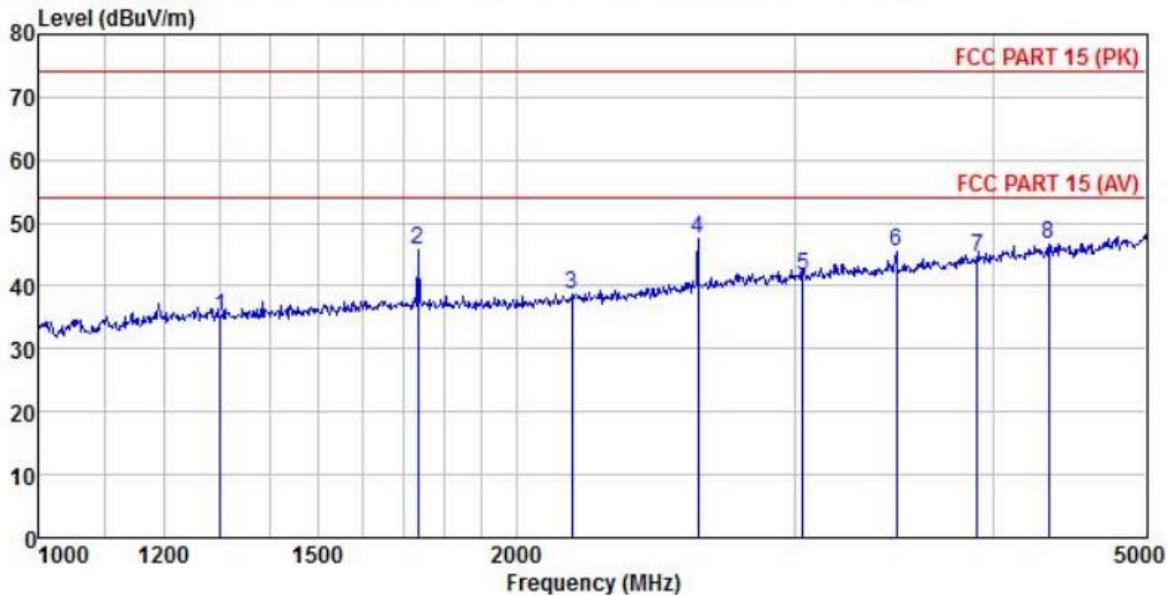


Freq MHz	Read Level dBuV	Antenna Factor dB/m	Cable Loss dB	Aux Factor dB	Preamplifier Factor dB	Limit Line dBuV/m	Over Limit dBuV/m	Over Limit dB	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 1302.060	51.57	24.71	3.47	1.25	41.04	39.96	74.00	-34.04	Peak
2 1733.995	48.64	25.53	4.03	1.47	41.14	38.53	74.00	-35.47	Peak
3 2168.725	48.65	26.38	4.48	1.64	41.68	39.47	74.00	-34.53	Peak
4 2605.477	52.20	27.64	4.95	1.75	41.88	44.66	74.00	-29.34	Peak
5 3035.913	46.92	28.51	5.36	1.92	41.49	41.22	74.00	-32.78	Peak
6 3475.384	52.01	28.60	5.73	2.18	41.43	47.09	74.00	-26.91	Peak
7 3908.657	47.75	30.01	6.10	2.20	41.80	44.26	74.00	-29.74	Peak
8 4339.709	47.37	30.37	6.62	2.31	41.92	44.75	74.00	-29.25	Peak

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Product Name:	CAR ALARM	Product Model:	91Z
Test By:	Yaro	Test mode:	Tx mode
Test Frequency:	1 GHz ~ 5 GHz	Polarization:	Horizontal
Test Voltage:	DC 6V	Environment:	Temp: 24°C Huni: 57%

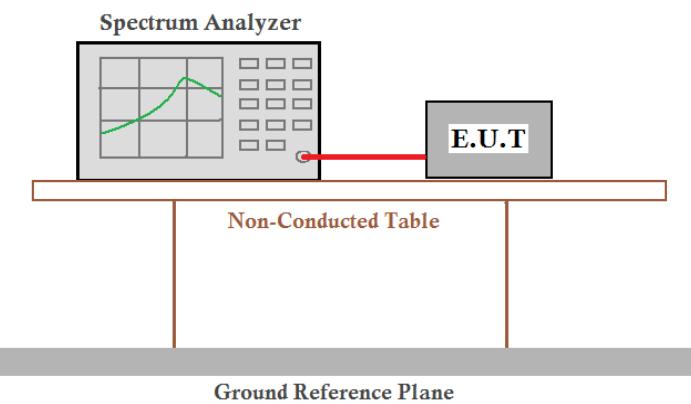


Freq MHz	Read	Antenna	Cable	Aux	Preamp	Limit	Over	Remark
	Freq MHz	Level dBuV	Level dB/m	Cable Loss dB	Factor Factor	Level dB	Line dBuV/m	
1 1302.060	46.79	24.71	3.47	1.25	41.04	35.18	74.00	-38.82 Peak
2 1733.995	55.97	25.54	4.03	1.47	41.14	45.87	74.00	-28.13 Peak
3 2168.725	47.88	26.38	4.48	1.64	41.68	38.70	74.00	-35.30 Peak
4 2605.477	55.06	27.65	4.95	1.75	41.88	47.53	74.00	-26.47 Peak
5 3035.913	47.35	28.51	5.36	1.92	41.49	41.65	74.00	-32.35 Peak
6 3475.384	50.50	28.60	5.73	2.18	41.43	45.58	74.00	-28.42 Peak
7 3908.657	47.94	30.01	6.10	2.20	41.80	44.45	74.00	-29.55 Peak
8 4339.709	49.23	30.37	6.62	2.31	41.92	46.61	74.00	-27.39 Peak

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

6.3 20dB Bandwidth

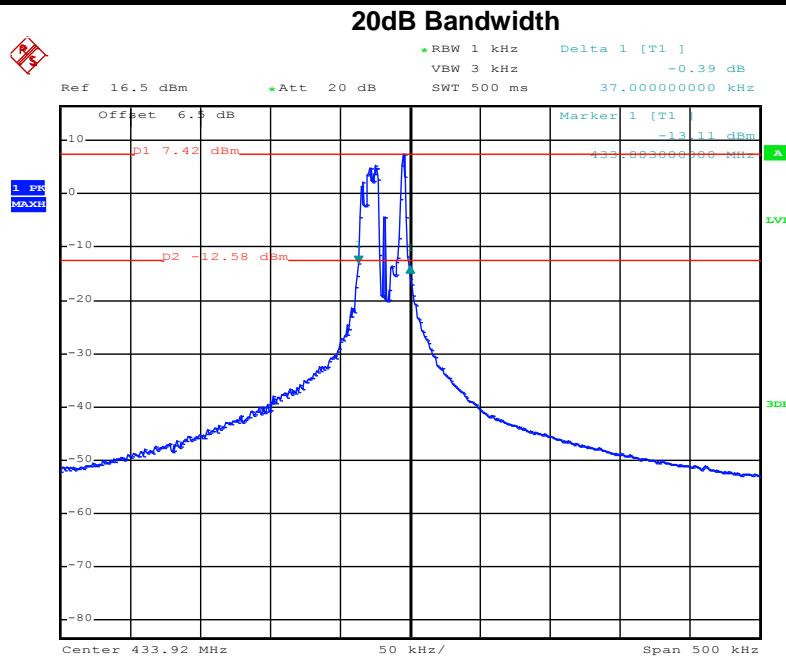
Test Requirement:	FCC Part15 C Section 15.231 (c)
Test Method:	ANSI C63.4:2014
Receiver setup:	RBW=1kHz, VBW=3kHz, detector: Peak
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 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.
Test Procedure:	<ol style="list-style-type: none"> According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. Set the EUT to proper test channel. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. Read 20dB bandwidth.
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a cable. The E.U.T is placed on a Non-Conducted Table. The entire setup is positioned above a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

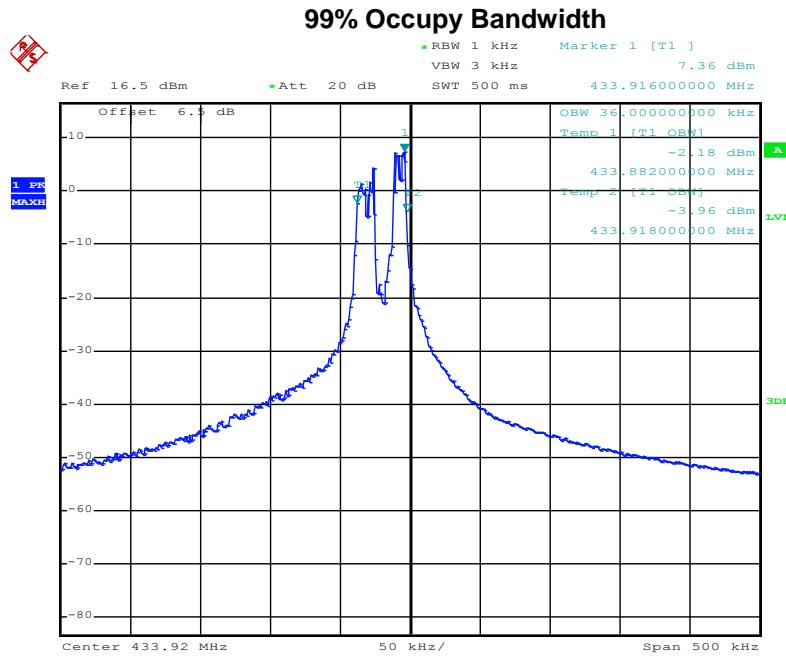
20dB bandwidth (MHz)	Limit (MHz)	99% Occupy Bandwidth (MHz)	Results
0.0370	1.0848	0.0360	Passed

Note: Limit= Fundamental frequency×0.25%=433.92×0.25%=1.0848MHz

Test plot as follows:

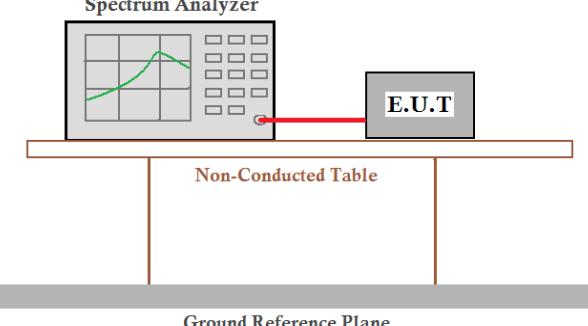


Date: 20.NOV.2019 07:23:07



Date: 20.NOV.2019 07:26:36

6.4 Duration Time

Test Requirement:	FCC Part15 C Section 15.231 (a) (1)
Test Method:	ANSI C63.10: 2013
Receiver setup:	RBW=1MHz, VBW=1MHz, span=0Hz, detector: Peak
Limit:	Not more than 5 seconds
Test mode:	Transmitting mode
Test Procedure:	<ol style="list-style-type: none"> According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. Set the EUT to proper test channel. Single scan the transmission, and read the transmission time.
Test setup:	<p style="text-align: center;">Spectrum Analyzer</p>  <p style="text-align: center;">Non-Conducted Table</p> <p style="text-align: center;">Ground Reference Plane</p>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

Duration time (second)	Limit (second)	Result
0.960	<5.0	Pass

Test plot as follows:

