

# 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.: 18TWLOR, 18TWPRLOR

**FCC ID:** TBQT12-LR2W

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.247

**Date of sample receipt:** 31 May., 2018

**Date of Test:** 31 May., to 15 Jun., 2018

**Date of report issued:** 15 Jun., 2018

**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	15 Jun., 2018	Original

**Tested by:** Zora Lee **Date:** 15 Jun., 2018  
**Test Engineer**

**Reviewed by:** Wimer Zhang **Date:** 15 Jun., 2018  
**Project Engineer**

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## 4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	N/A
Conducted Peak Output Power	15.247 (b)(3)	Pass
6dB Emission Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247(d)	Pass
Spurious Emission	15.205/15.209	Pass

*Pass: The EUT complies with the essential requirements in the standard.*

## 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.:	18TWLOR, 18TWPROR
Operation Frequency:	916.3 MHz
Channel numbers:	1
Modulation technology:	Lora
Antenna Type:	Helix Antenna
Antenna gain:	-1.25dBi
Power supply:	DC 3V(CR2450 Battery)
Remark:	Item No.: 18TWLOR, 18TWPROR were identical inside, the electrical circuit design, layout, components used and internal wiring, with only difference being model name and for different areas.

### 5.3 Test environment and mode

<b>Operating Environment:</b>	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
<b>Test mode:</b>	
Operation mode	Keep the EUT in continuous transmitting with modulation
<p>The sample was placed 0.8m(below 1GHz)/1.5m(above 1GHz) above the ground plane of 3m 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 &amp; Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the 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. Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.</p>	

### 5.4 Description of Support Units

N/A
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### 5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Radiated Emission (9kHz ~ 30MHz)	±2.76 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.28 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.72 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±2.88 dB (k=2)

### 5.6 Laboratory Facility

<p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> <li>● <b>FCC - Registration No.: 727551</b> Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.</li> <li>● <b>IC - Registration No.: 10106A-1</b> 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.</li> <li>● <b>CNAS - Registration No.: CNAS L6048</b> 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.</li> <li>● <b>A2LA - Registration No.: 4346.01</b> 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: <a href="https://portal.a2la.org/scopepdf/4346-01.pdf">https://portal.a2la.org/scopepdf/4346-01.pdf</a></li> </ul>
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### 5.7 Laboratory Location

<p>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</p>
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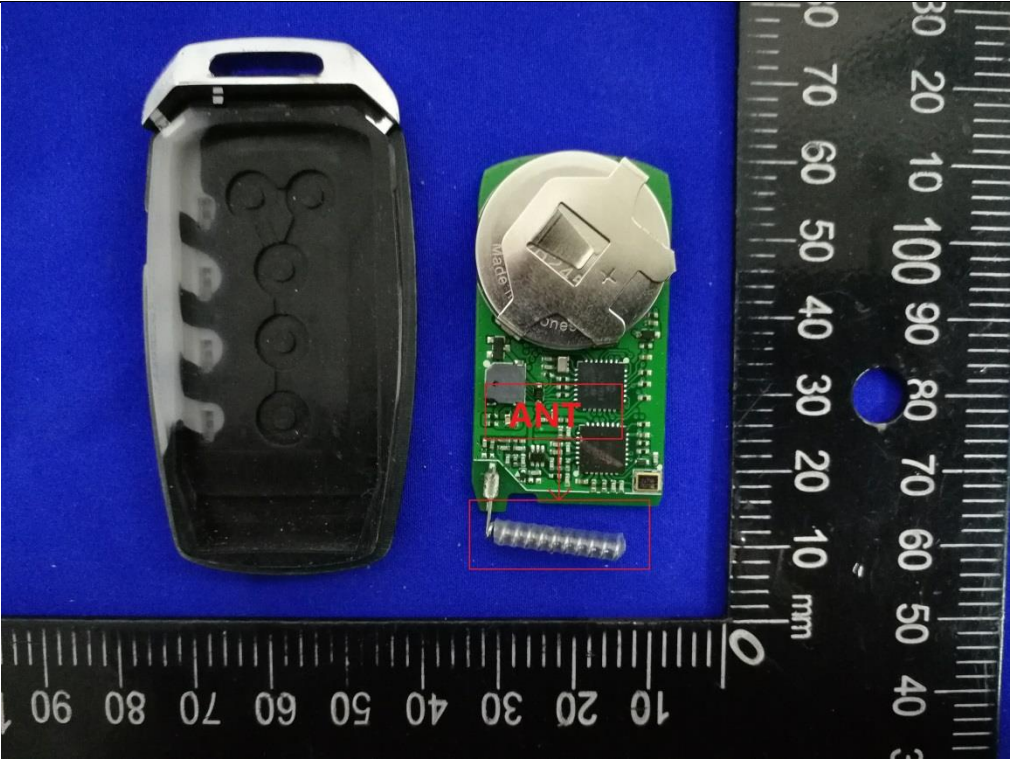
## 5.8 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	3m SAC	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	08-23-2014	08-22-2020
2	BiConiLog Antenna	SCHWARZBECK	VULB9163	CCIS0005	02-25-2018	02-24-2019
3	Horn Antenna	SCHWARZBECK	BBHA9120D	CCIS0006	02-25-2018	02-24-2019
4	Pre-amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	02-25-2018	02-24-2019
5	Pre-amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	02-25-2018	02-24-2019
6	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	02-25-2018	02-24-2019
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	02-25-2018	02-24-2019
8	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP30	CCIS0023	02-25-2018	02-24-2019
9	EMI Test Receiver	Rohde & Schwarz	ESRP7	CCIS0167	02-25-2018	02-24-2019
10	Loop antenna	Laplace instrument	RF300	EMC0701	02-25-2018	02-24-2019
11	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongShuo Electron	11.0(L)x4.0(W)x3.0(H)	CCIS0061	07-22-2017	07-21-2020
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	02-25-2018	02-24-2019
3	LISN	CHASE	MN2050D	CCIS0074	02-25-2018	02-24-2019
4	LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	02-25-2018	02-24-2019
5	Coaxial Cable	CCIS	N/A	CCIS0086	02-25-2018	02-24-2019
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Power Sensor	D.A.R.E	RPR3006W	17100015SNO27	11-10-2017	11-09- 2018
8	Power Sensor	D.A.R.E	RPR3006W	17100015SNO28	11-10-2017	11-09- 2018

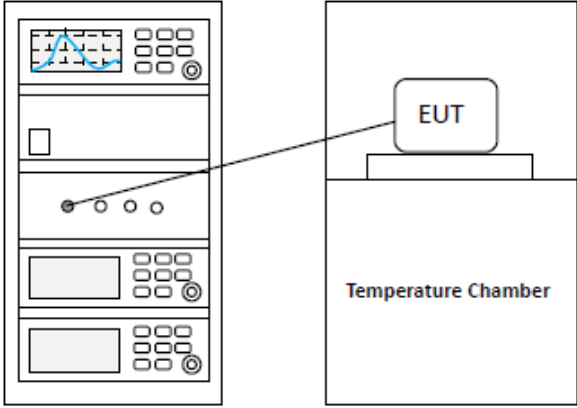
## 6 Test results and Measurement Data

### 6.1 Antenna requirement:

<b>Standard requirement:</b>	FCC Part15 C Section 15.203 /247(c)
<p><i>15.203 requirement:</i>  <i>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.</i></p>	
<b>E.U.T Antenna:</b>	
<p><i>The antenna is an coil antenna which cannot replace by end-user, the best case gain of the antenna is -1.25 dBi.</i></p>	
 <p>The photograph shows a black plastic device on the left and its internal green PCB on the right. A red box on the PCB highlights a small silver coil antenna. A ruler is placed below the components for scale, showing measurements in millimeters. The antenna is a small, cylindrical coil.</p>	



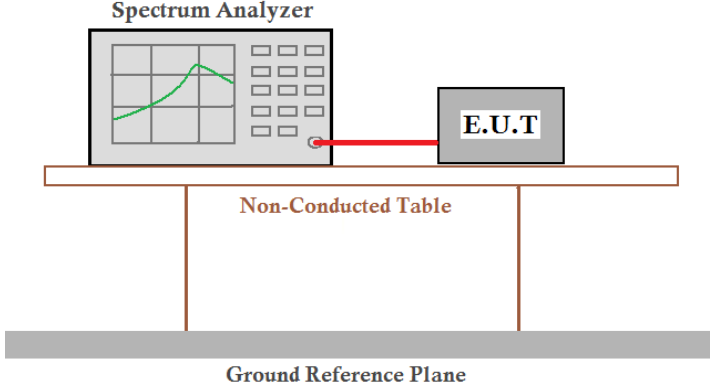
## 6.2 Conducted Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.10:2013 and KDB 558074(latest version)
Limit:	30dBm
Test setup:	 <p>The diagram illustrates the test setup. On the left is a spectrum analyzer with a blue waveform on its screen. A cable connects the spectrum analyzer to a box labeled 'EUT' (Equipment Under Test). The EUT is placed on top of a larger box labeled 'Temperature Chamber'.</p>
Test procedure:	<ol style="list-style-type: none"> <li>1. Use a fast power sensor suitable for 2,4 GHz and capable of 1 MS/s.</li> <li>2. Connect the power sensor to the transmit port, sample the transmit signal and store the raw data, every channel 25 bursts. Use these stored samples in all following steps.</li> <li>3. Find the start and stop times of each burst in the stored measurement samples.</li> <li>4. Between the start and stop times of each individual burst calculate the RMS power over the burst. Save these P<sub>burst</sub> values, as well as the start and stop times for each burst.</li> <li>5. The highest of all P<sub>burst</sub> values (value "A" in dBm) will be used for maximum e.i.r.p. calculations.</li> </ol> <p>Add the (stated) antenna assembly gain "G" in dBi of the individual antenna. The RF Output Power (P) shall be calculated using the formula below: <math>P = A + G</math></p>
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

### Measurement Data:

Test Frequency	Maximum Conducted Output Power (dBm)	Limit(dBm)	Result
916.3 MHz	17.53	30.00	Pass

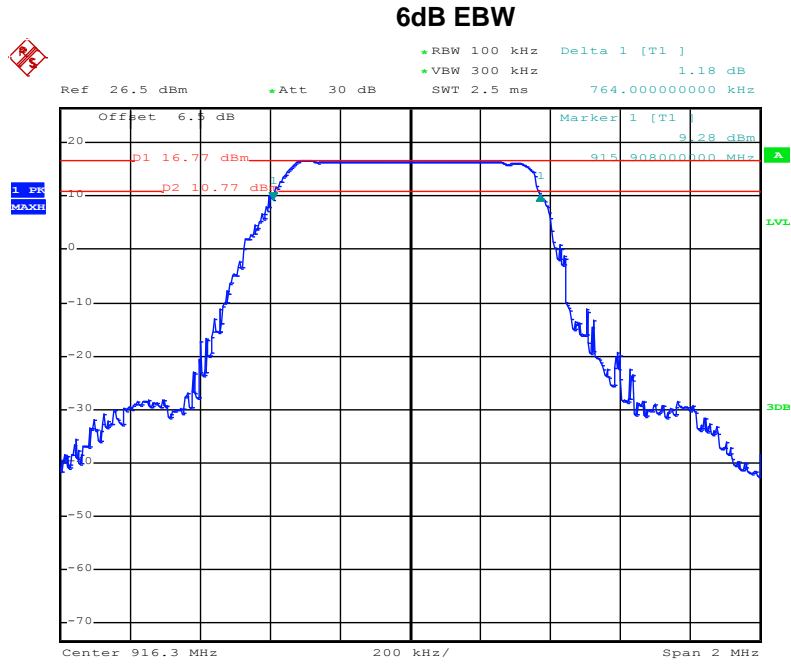
## 6.3 Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.10:2013 and KDB 558074(latest version)
Limit:	>500kHz
Test setup:	 <p>The diagram shows a Spectrum Analyzer on the left and an E.U.T. on the right, connected by a red cable. They are both on a table labeled 'Non-Conducted Table'. Below the table is a '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

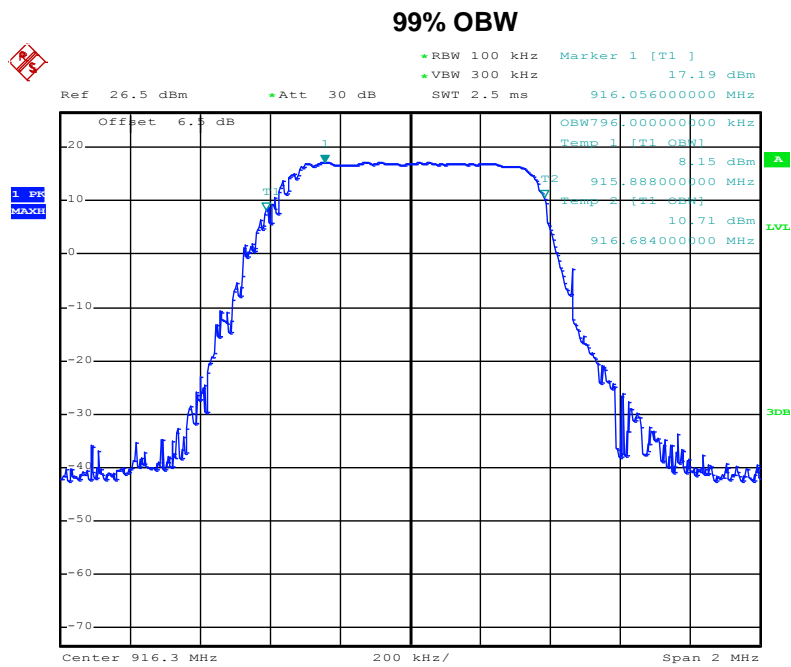
### Measurement Data:

Test Frequency	6dB Emission Bandwidth (MHz)	Limit(kHz)	Result
916.3 MHz	0.764	>500	Pass
Test Frequency	99% Occupy Bandwidth (MHz)	Limit(kHz)	Result
916.3 MHz	0.796	N/A	N/A

Test plot as follows:

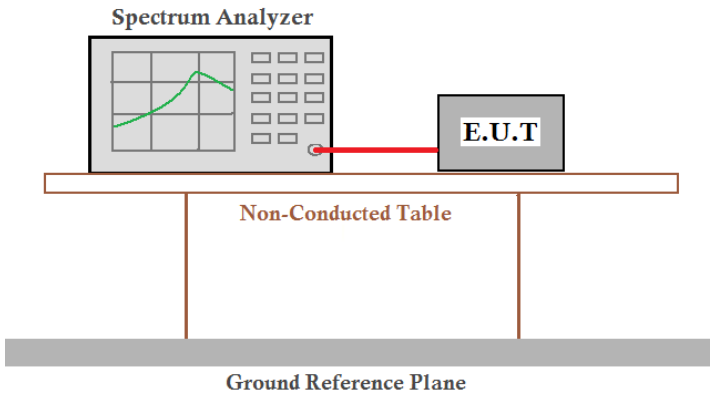


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Date: 7.JUN.2018 17:44:09

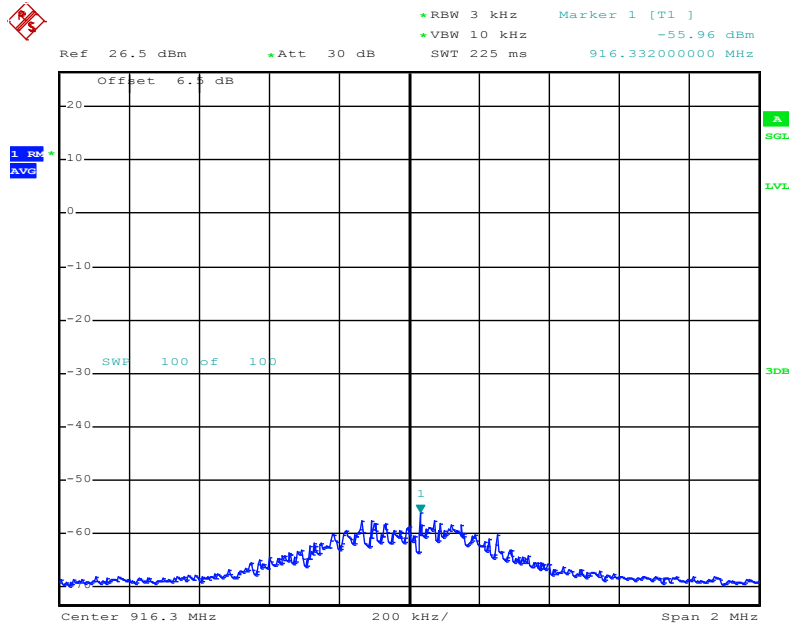
## 6.4 Power Spectral Density

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	ANSI C63.10:2013 and KDB 558074(latest version)
Limit:	8dBm
Test setup:	
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

### Measurement Data:

Test Frequency	Power Spectral Density (dBm)	Limit(dBm)	Result
916.3 MHz	-55.96	8.00	Pass

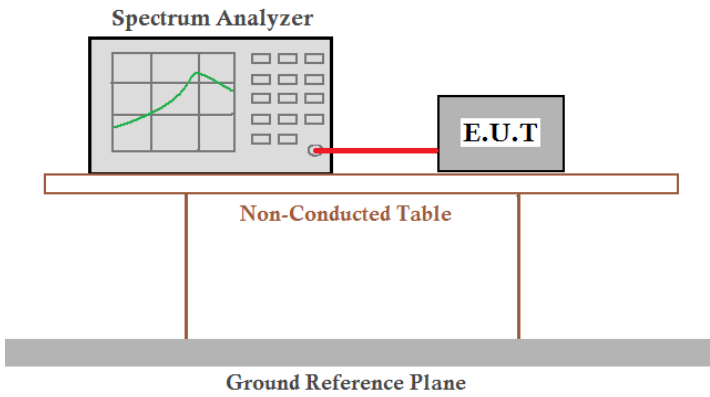
Test plots as follow:



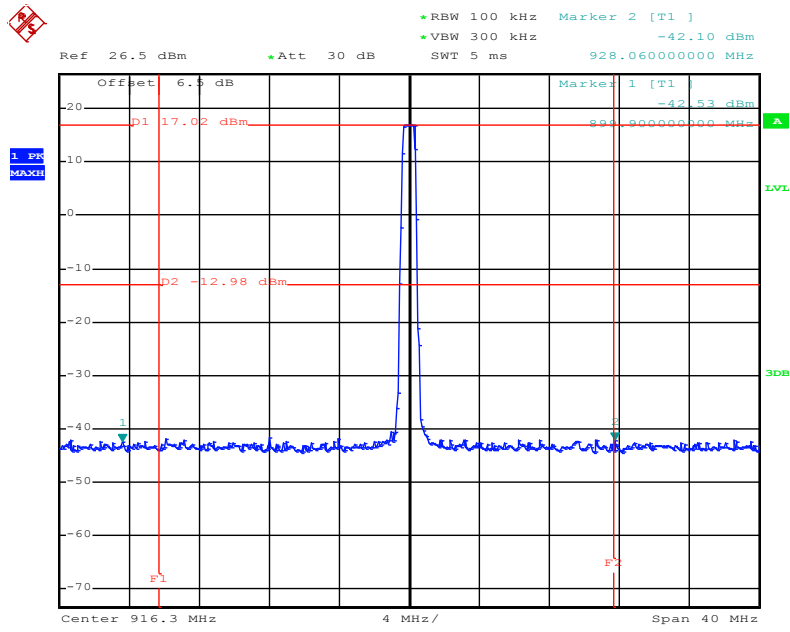
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## 6.5 Band Edge

### 6.5.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and KDB 558074(latest version)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spreadpectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. Below the table is a 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

Test plots as follow:

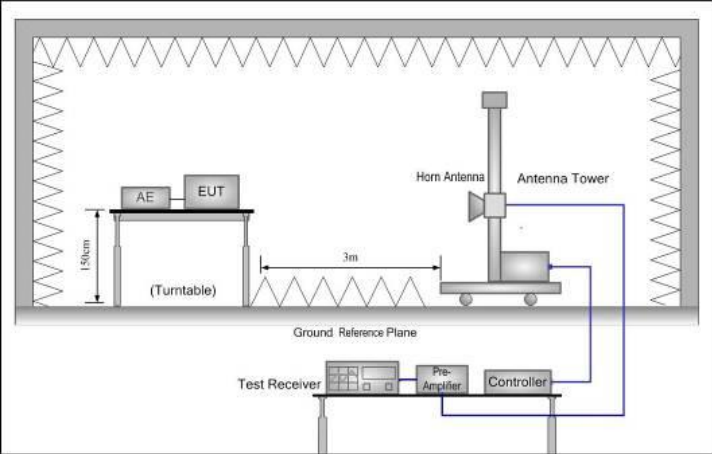


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## 6.5.2 Radiated Emission Method

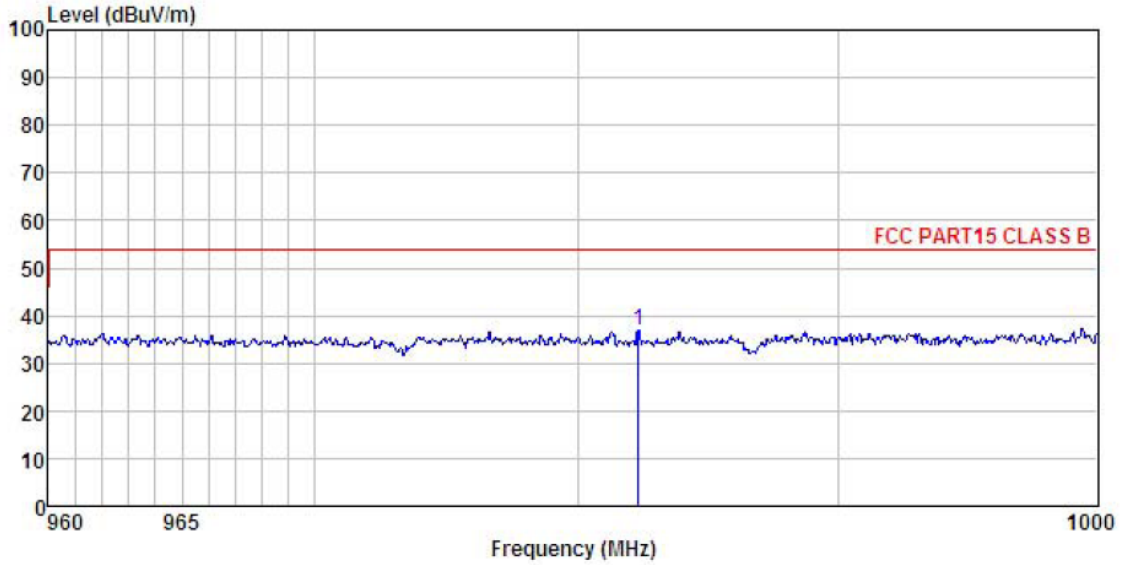
Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.10: 2013 and KDB 558074(latest version)				
Test Frequency Range:	960MHz to 1.240GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	960MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
RMS		1MHz	3MHz	Average Value	
Limit:	Frequency	Limit (dBuV/m @3m)		Remark	
	960MHz-1GHz	54.00		Quasi-peak Value	
	Above 1GHz	54.00		Average Value	
74.00		Peak Value			
Test Procedure:	<ol style="list-style-type: none"> <li>1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz) /1.5m(above 1GHz) above the groundat a 3 meter chamber.The table was rotated 360 degrees todetermine the position of the highest radiation.</li> <li>2. The EUT was set 3 meters away from the interference-receiving antenna, whichwas mounted on the top of a variable-height antenna tower.</li> <li>3. 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.</li> <li>4. For each suspected emission, the EUT was arranged to its worst case and thenthe antenna was tuned to heights from 1 meter to 4 meters and the rotatablewas turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>5. The test-receiver system was set to Peak Detect Function and SpecifiedBandwidth with Maximum Hold Mode.</li> <li>6. If the emission level of the EUT in peak mode was 10dB lower than the limitspecified, then testing could be stopped and the peak values of the EUT wouldbe reported. Otherwise the emissions that did not have 10dB margin would bere-tested one by one using peak, quasi-peak or average method as specified andthen reported in a data sheet.</li> </ol>				
Test setup:	<p>Below 1GHz</p>				



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

Below 1GHz

Horizontal:

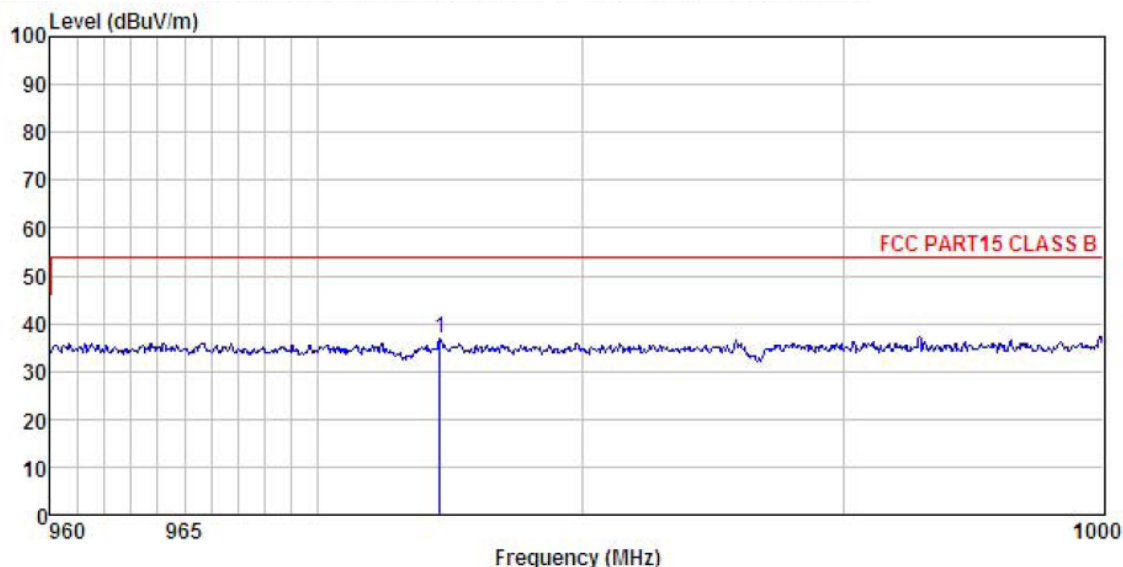


Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163(30M2G) HORIZONTAL  
 EUT : CAR ALARM  
 Model : 18TWLOR  
 Test mode : TX mode  
 Power Rating : DC 3V  
 Environment : Temp:25.5°C Humi:55%  
 Test Engineer: Zora  
 Remark :

	ReadAntenna	Cable	Preamp	Limit	Over			
Freq	Level	Factor	Loss	Factor	Level	Line		
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m		
1	982.279	9.98	22.66	4.38	0.00	37.02	54.00	-16.98

Test channel: Lowest

Vertical:



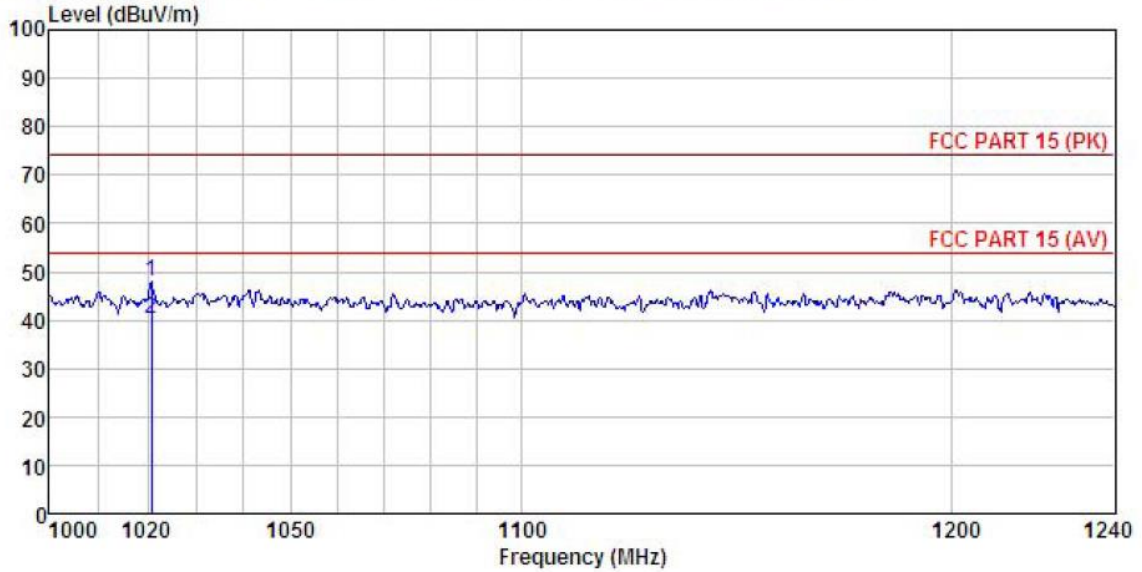
```

Site       : 3m chamber
Condition  : FCC PART15 CLASS B 3m VULB9163(30M2G) VERTICAL
EUT        : CAR ALARM
Model      : 18TWLOR
Test mode  : TX mode
Power Rating : DC 3V
Environment : Temp:25.5°C Humi:55%
Test Engineer: Zora
Remark     :
    
```

	ReadAntenna	Cable	Preamp	Limit	Over			
Freq	Level	Factor	Loss	Factor	Level	Line		
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m		
1	974.610	10.10	22.60	4.34	0.00	37.04	54.00	-16.96

Above 1GHz

Horizontal:



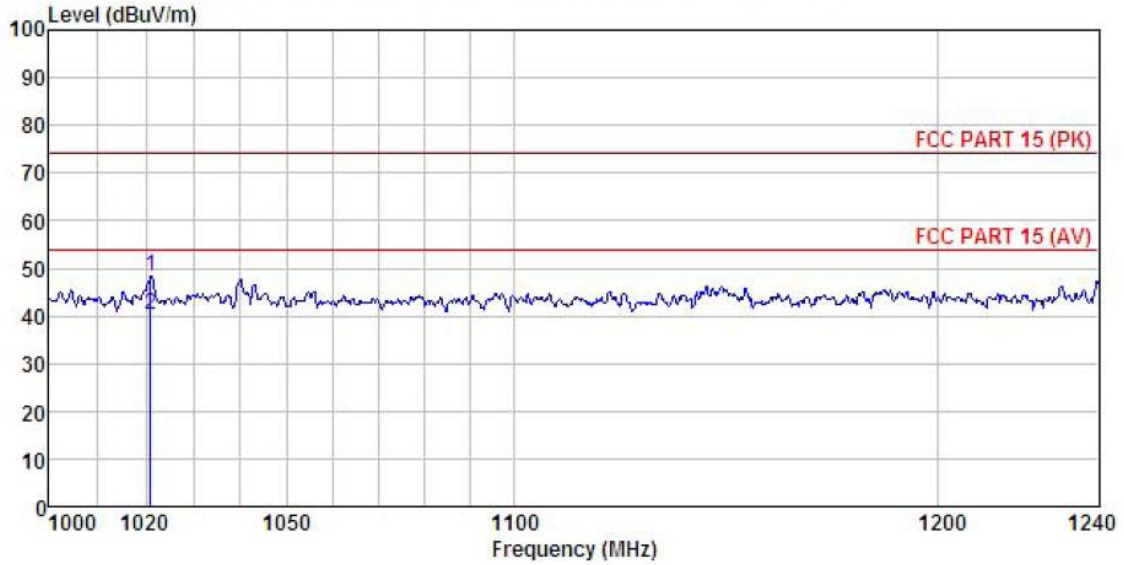
```

Site       : 3m chamber
Condition  : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL
EUT       : CAR ALARM
Model     : 18TWLOR
Test mode : TX mode
Power Rating : DC 3V
Environment : Temp:25.5°C Humi:55%
Test Engineer: Zora
Remark    :
    
```

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1020.865	21.12	23.68	3.05	0.00	47.85	74.00	-26.15	Peak
2	1020.865	13.47	23.68	3.05	0.00	40.20	54.00	-13.80	Average

Test channel: Highest

Vertical:



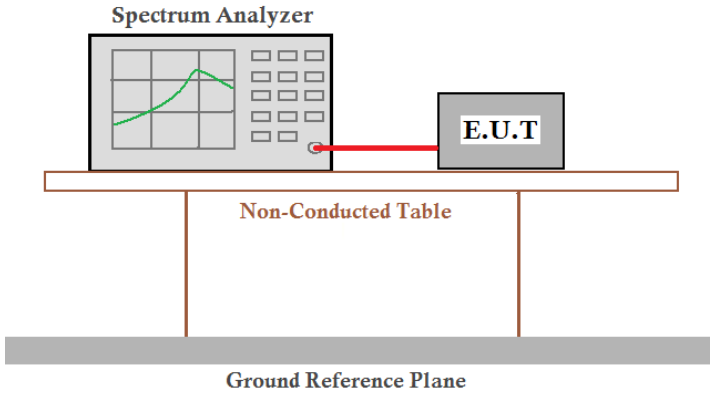
```

Site       : 3m chamber
Condition  : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL
EUT        : CAR ALARM
Model      : 18TWLOR
Test mode  : TX mode
Power Rating : DC 3W
Environment : Temp:25.5°C Humi:55%
Test Engineer: Zora
Remark    :
    
```

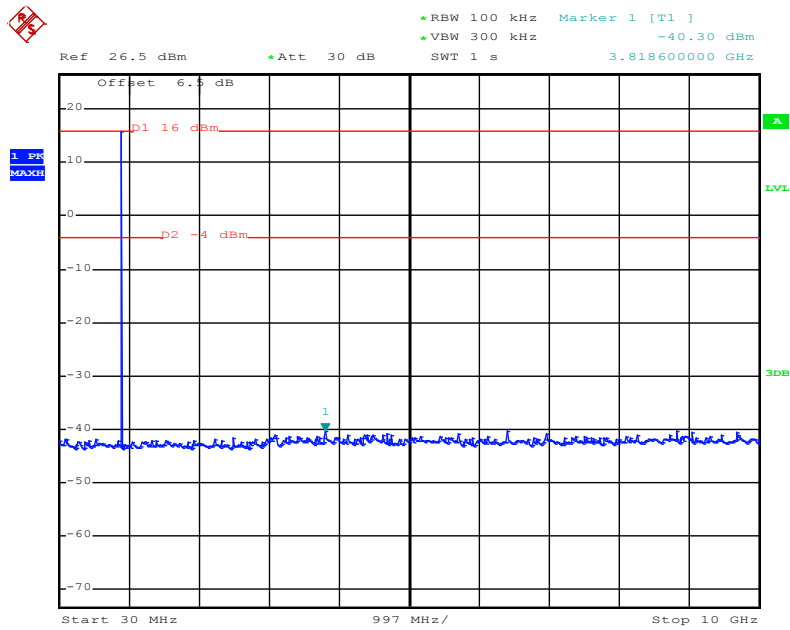
	ReadAntenna	Cable	Preamp	Limit	Over			
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	
-----MHz	-----dBUV	-----dB/m	-----dB	-----dB	-----dBUV/m	-----dBUV/m	-----dB	
1	1021.085	21.55	23.68	3.05	0.00	48.28	74.00	-25.72 Peak
2	1021.085	13.58	23.68	3.05	0.00	40.31	54.00	-13.69 Average

## 6.6 Spurious Emission

### 6.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and KDB 558074(latest version)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by two legs and sits on a 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

Test plot as follows:



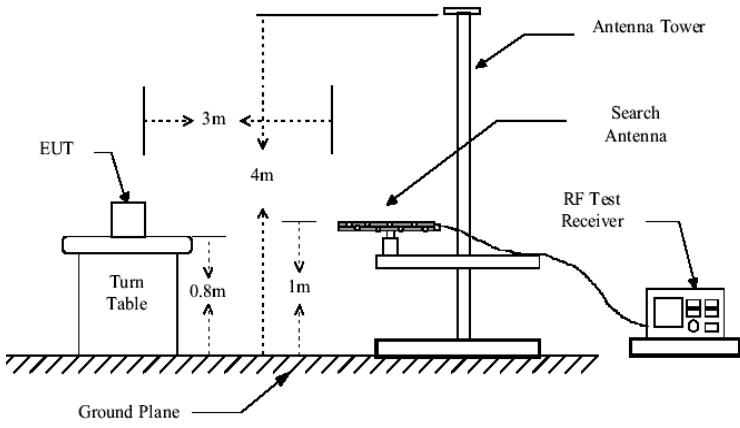
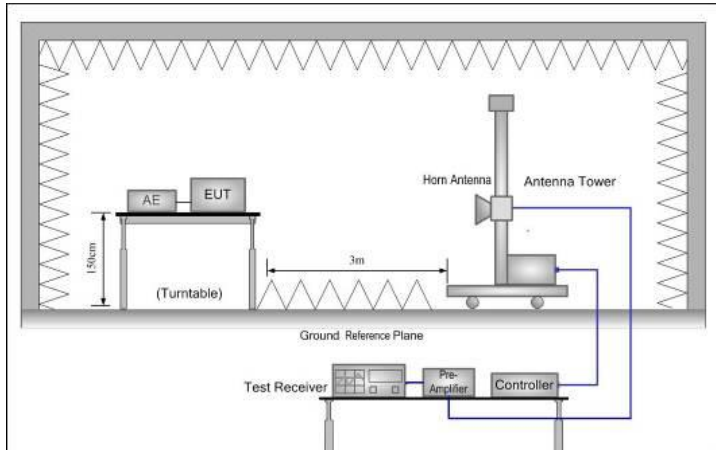
Date: 7.JUN.2018 17:50:35

30MHz~10GHz

## 6.6.2 Radiated Emission Method

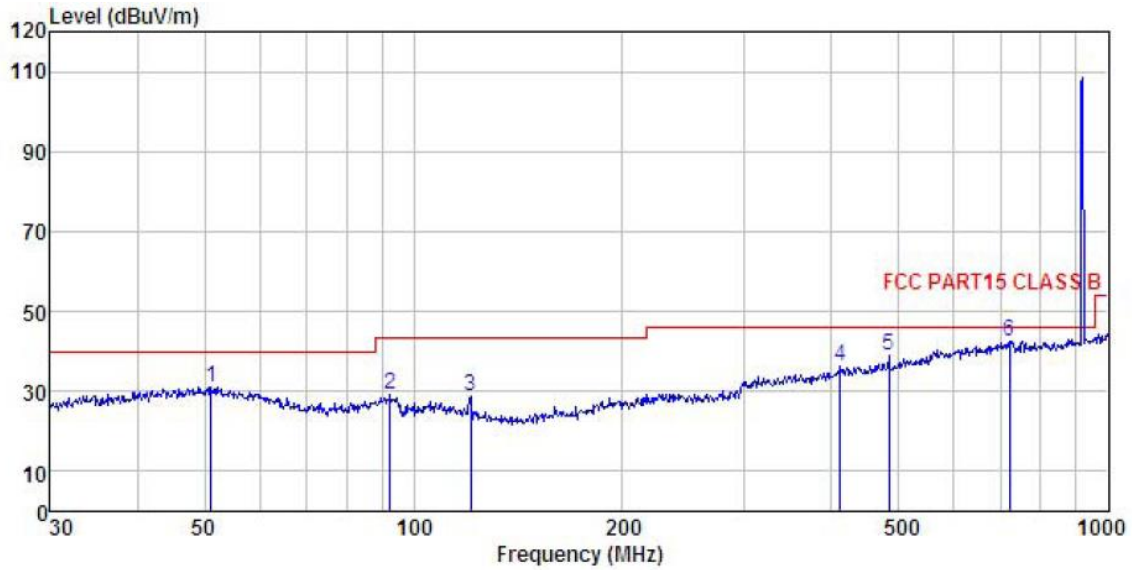
Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9KHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value
Limit:	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			
Test Procedure:	<ol style="list-style-type: none"> <li>1. 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.</li> <li>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>3. 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.</li> <li>4. 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 rotating table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>6. 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.</li> </ol>				



<p>Test setup:</p>	<p>Below 1GHz</p>  <p>Above 1GHz</p> 
<p>Test Instruments:</p>	<p>Refer to section 5.8 for details</p>
<p>Test mode:</p>	<p>Refer to section 5.3 for details</p>
<p>Test results:</p>	<p>Passed</p>
<p>Remark:</p>	<ol style="list-style-type: none"> <li>1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case.</li> <li>2. 9 kHz to 30MHz is too low, so only shows the data of above 30MHz in this report.</li> </ol>

## Below 1GHz

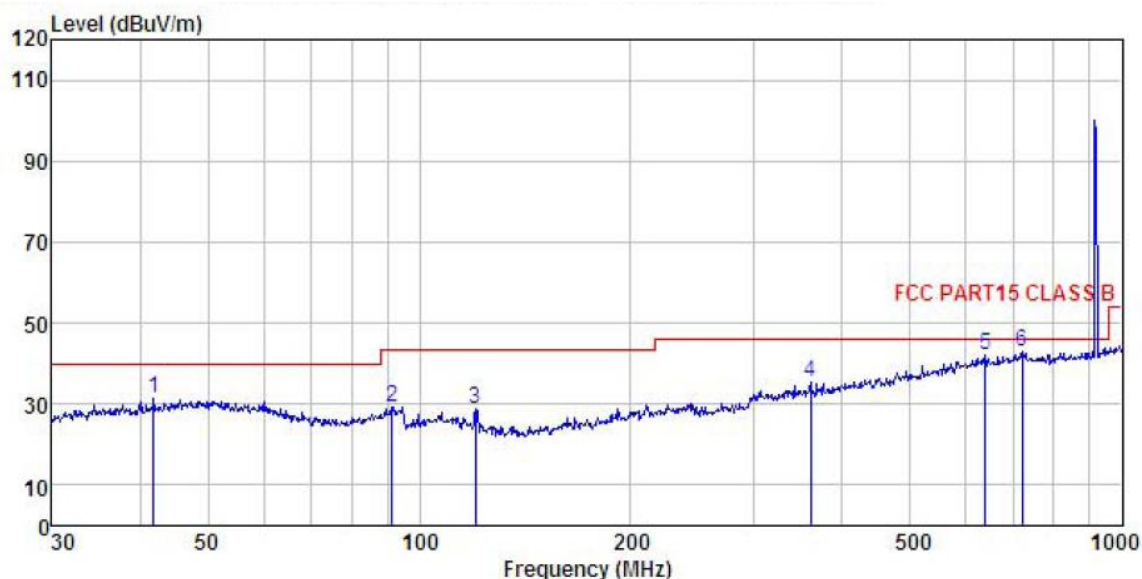
Horizontal:



Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163(30M2G) HORIZONTAL  
 EUT : CAR ALARM  
 Model : 18TWLOR  
 Test mode : TX Mode  
 Power Rating : DC 3V  
 Environment : Temp:25.5°C Humi:55%  
 Test Engineer: Zora  
 REMARK :

Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	51.121	15.90	13.89	1.27	0.00	31.06	40.00	-8.94 QP
2	92.462	16.92	10.44	2.03	0.00	29.39	43.50	-14.11 QP
3	120.699	16.42	10.09	2.18	0.00	28.69	43.50	-14.81 QP
4	411.824	17.40	15.65	3.11	0.00	36.16	46.00	-9.84 QP
5	483.910	18.27	17.07	3.48	0.00	38.82	46.00	-7.18 QP
6	721.726	18.04	20.33	4.26	0.00	42.63	46.00	-3.37 QP

Vertical:



Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163(30M2G) VERTICAL  
 EUT : CAR ALARM  
 Model : 18TWLOR  
 Test mode : TX Mode  
 Power Rating : DC 3V  
 Environment : Temp:25.5°C Humi:55%  
 Test Engineer: Zora  
 REMARK :

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	
	MHz	dBuV	Factor	Loss	Factor	Level	Line	Limit Remark
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	41.860	17.13	13.15	1.24	0.00	31.52	40.00	-8.48 QP
2	91.495	17.06	10.27	2.03	0.00	29.36	43.50	-14.14 QP
3	120.277	16.26	10.16	2.17	0.00	28.59	43.50	-14.91 QP
4	360.448	17.40	14.80	3.10	0.00	35.30	46.00	-10.70 QP
5	638.369	18.44	19.66	3.88	0.00	41.98	46.00	-4.02 QP
6	721.726	18.16	20.33	4.26	0.00	42.75	46.00	-3.25 QP

**Above 1GHz**

Peak value									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor(dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1832.60	45.93	26.07	4.17	2.42	41.31	37.28	74.00	-36.72	Vertical
2748.90	46.24	28.12	5.08	2.88	41.72	40.60	74.00	-33.40	Vertical
3665.20	46.55	29.38	5.96	2.97	41.63	43.23	74.00	-30.77	Vertical
4581.50	46.51	31.23	6.87	3.57	42.12	46.06	74.00	-27.94	Vertical
5497.80	45.64	32.31	7.13	3.92	41.86	47.14	74.00	-26.86	Vertical
1832.60	47.14	26.07	4.17	2.42	41.31	38.49	74.00	-35.51	Horizontal
2748.90	45.98	28.12	5.08	2.88	41.72	40.34	74.00	-33.66	Horizontal
3665.20	46.13	29.38	5.96	2.97	41.63	42.81	74.00	-31.19	Horizontal
4581.50	46.92	31.23	6.87	3.57	42.12	46.47	74.00	-27.53	Horizontal
5497.80	45.90	32.31	7.13	3.92	41.86	47.40	74.00	-26.60	Horizontal
Average value									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Aux Factor(dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1832.60	36.23	26.07	4.17	2.42	41.31	27.64	54.00	-26.36	Vertical
2748.90	37.45	28.12	5.08	2.88	41.72	31.79	54.00	-22.21	Vertical
3665.20	37.89	29.38	5.96	2.97	41.63	34.62	54.00	-19.38	Vertical
4581.50	37.78	31.23	6.87	3.57	42.12	37.37	54.00	-16.63	Vertical
5497.80	36.26	32.31	7.13	3.92	41.86	37.77	54.00	-16.23	Vertical
1832.60	37.86	26.07	4.17	2.42	41.31	29.31	54.00	-24.69	Horizontal
2748.90	36.24	28.12	5.08	2.88	41.72	30.58	54.00	-23.42	Horizontal
3665.20	36.95	29.38	5.96	2.97	41.63	33.68	54.00	-20.32	Horizontal
4581.50	37.54	31.23	6.87	3.57	42.12	37.13	54.00	-16.87	Horizontal
5497.80	36.57	32.31	7.13	3.92	41.86	38.08	54.00	-15.92	Horizontal

*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.*