



# **FCC TEST REPORT**

**FCC ID: 2AR47-WDJ7052**

On Behalf of

**Zhejiang Shunkang Technology Industry Co., Ltd**

**Digital Meat Thermometer**

**Model No.: WDJ7052, WDJ7011, WDJ7050, WDJ7060,  
WDJ7051, WDJ7053, WDJ7055, WDJ7056, WDJ7057.  
WDJ7058, WDJ7059**

Prepared for : Zhejiang Shunkang Technology Industry Co., Ltd  
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### TEST REPORT DECLARATION

Applicant : Zhejiang Shunkang Technology Industry Co., Ltd  
 Address : No. 2 ,3 Lane Fuxiang North Road Yuyao, Zhejiang, P.R. China  
 Manufacturer : Zhejiang Shunkang Technology Industry Co., Ltd  
 Address : No. 2 ,3 Lane Fuxiang North Road Yuyao, Zhejiang, P.R. China  
 EUT Description : Digital Meat Thermometer  
 (A) Model No. : WDJ7052, WDJ7011, WDJ7050, WDJ7060,  
 WDJ7051, WDJ7053, WDJ7055, WDJ7056,  
 WDJ7057. WDJ7058, WDJ7059  
 (B) Trademark : N/A

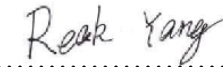
Measurement Standard Used:


**FCC Rules and Regulations Part 15 Subpart C Section 15.231: 2017**  
**ANSI C63.10-2013**

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....: Reak Yang   
 Project Engineer .....

Approved by (name + signature).....: Simple Guan   
 Project Manager .....

Date of issue..... : January 10, 2019

**Revision History**

Revision	Issue Date	Revisions	Revised By
00	January 10, 2019	Initial released Issue	Simple Guan

## 1. General Information

### 1.1. Description of Device (EUT)

EUT	: Digital Meat Thermometer
Model No.	: WDJ7052, WDJ7011, WDJ7050, WDJ7060, WDJ7051, WDJ7053, WDJ7055, WDJ7056, WDJ7057. WDJ7058, WDJ7059
DIFF.	: There is no difference between all the models, except the model number, this report performs the model WDJ7052.
Trade mark	: N/A
Power supply	: DC 3V by AAA*2 Battery.
Operation frequency	: 433.92MHz
Modulation	: ASK
Antenna Type	: Internal Antenna, Maximum Gain is 2dBi
Software version	: V1.0
Hardware version	: V1.0
Product Size	: Length: 99.6mm Width: 98.6mm Height: 36.2mm

## 1.2. Accessories of Device (EUT)

Accessories1 : /  
Manufacturer : /  
Model : /  
Power supply : /

## 1.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or DOC
/	/	/	/	/	/

## 1.4. Test Facility

Shenzhen Alpha Product Testing Co., Ltd  
Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103,  
Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission  
Registration Number: 293961  
Designation Number: CN1236  
July 25, 2017 Certificated by IC  
Registration Number: 12135A

## 2. Summary of test

### 2.1. Summary of test result

<b>Description of Test Item</b>	<b>Standard</b>	<b>Results</b>
Spurious Emission	Section 15.231(e)&15.209	PASS
Conduction Emission	Section 15.207	N/A
Occupied bandwidth	Section 15.231(c)	PASS
Transmission time	Section 15.231(e)	PASS
Band Edge	Section 15.231(b)(1)	N/A
Antenna Requirement	Section 15.203	PASS
Note : Test according to ANSI C63.10-2013		

## 2.2. Block Diagram

- For radiated emissions test: EUT was placed on a turn table, which is 0.8 meters high above ground for below 1 GHz test and 1.5 meters high above ground for below 1 GHz test. EUT was set into test mode before test. New battery is used during all test



## 2.3. Test mode

EUT work in Continuous TX mode, and select test channel, wireless mode

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
ASK	CH1	433.92

## 2.4. Hardware operating method (Used for test) from client

Mode	Special Hardware operating is used. The Hardware operating method is provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.		
Power level setup by client			
Mode	Channel	Frequency (MHz)	Soft Set
ASK	1	433.92	TX level is set as defaults value.

## 2.5. Test Conditions

Temperature range	21-25°C
Humidity range	40-75%
Pressure range	86-106kPa



## 2.6. Measurement Uncertainty (95% confidence levels, k=2)

Item	Uncertain
Uncertainty for Power point Conducted Emissions Test	2.74dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB(Polarize: V)
	2.57dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.77dB(Polarize: V)
	3.80dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.16dB(Polarize: H)
	4.13dB(Polarize: V)
Uncertainty for radio frequency	$5.4 \times 10^{-8}$
Uncertainty for conducted RF Power	0.37dB
Uncertainty for temperature	0.2°C
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

## 2.7. Test Equipment

Equipment	Manufacture	Model No.	Serial No.	Last Cal.	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	2018.09.21	1 Year
Signal Analyzer	Agilent	N9020A	MY499100060	2018.09.11	1 Year
Spectrum analyzer	ROHDE&SCHWARZ	FSU	1166.1660.26	2018.09.21	1 Year
Receiver	R&S	ESR	1316.3003K03-102082-Wa	2018.09.21	1 Year
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-438	2018.04.13	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2018.04.13	2Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2018.04.13	1 Year
Cable	Resenberger	N/A	No.1	2018.09.21	1 Year
Cable	Resenberger	N/A	No.2	2018.09.21	1 Year
Cable	Resenberger	N/A	No.3	2018.09.21	1 Year

### 3. Radiation Emission

#### 3.1. Radiation Emission Limits(15.209&231)

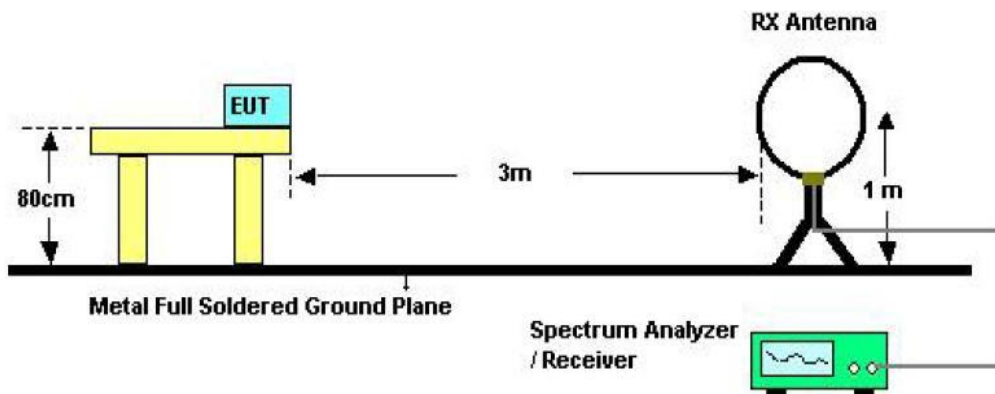
Frequency (MHz)	Field Strength Limits at 3 metres (watts, e.i.r.p.)		
	uV/m	dB uV/m	Measurement distance(m)
0.009-0.490	2400/F(kHz)	XX	300
0.490-1.705	24000/F(kHz)	XX	30
1.705-30	30	29.5	30
30~88	100(3nW)	40	3
88~216	150(6.8nW)	43.5	3
216~960	200(12nW)	46	3
Above960	500(75nW)	54	3
Carrier frequency		72.87(AV)	3
Carrier frequency		92.87(PK)	3

**NOTE:**

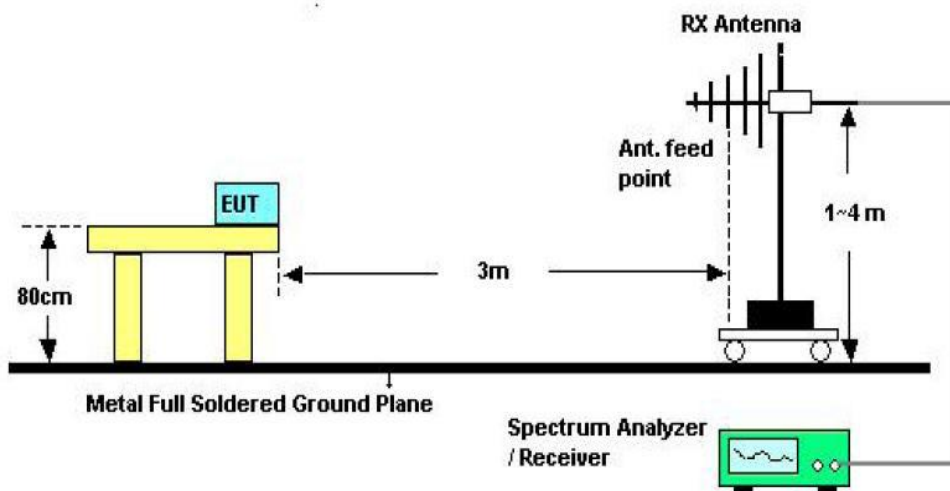
- a) The tighter limit applies at the band edges.
- b) Emission Level(dB uV/m)=20log Emission Level(uV/m)

#### 3.2. Test Setup

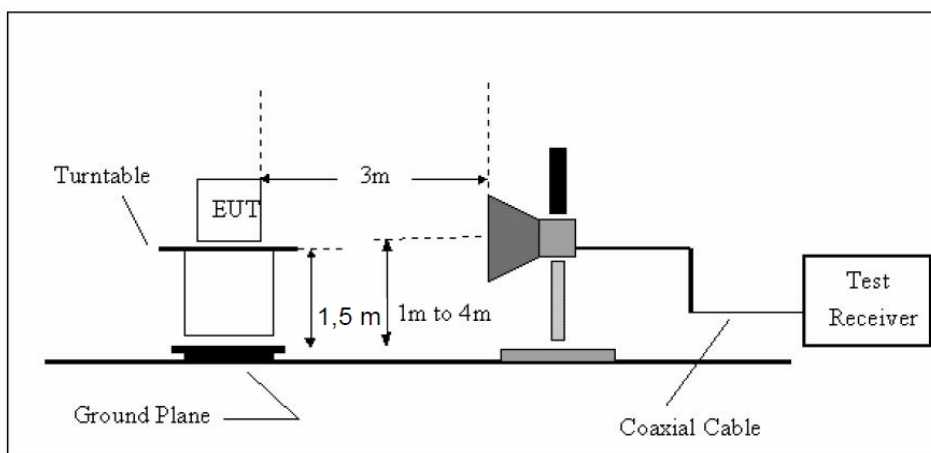
See the next page.



Below 30MHz Test Setup



Above 30MHz Test Setup



Above 1GHz Test Setup

### 3.3. Test Procedure

- a) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1GHz, The EUT was placed on a rotating 0.8 m high above ground, The table was rotated 360 degrees to determine the position of the highest radiation
- b) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- c) The initial step in collecting conducted emission data is a spectrum analyzer Peak detector mode pre-scanning the measurement frequency range. Significant Peaks are then marked. and then Quasi Peak Detector mode re-measured
- d) If Peak value comply with QP limit Below 1GHz. The EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.
- e) For the actual test configuration, please see the test setup photo.

### 3.4. Test Equipment Setting For emission test.

9KHz~150KHz	RBW 200Hz	VBW 1KHz
150KHz~30MHz	RBW 9KHz	VBW 30KHz
30MHz~1GHz	RBW 120KHz	VBW 300KHz
Above 1GHz	RBW 1MHz	VBW 3MHz

### 3.5. Test Condition

Continual Transmitting in maximum power (The new battery be used during Test)

### 3.6. Test Result

We have scanned the 10th harmonic from 9KHz to the EUT.  
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

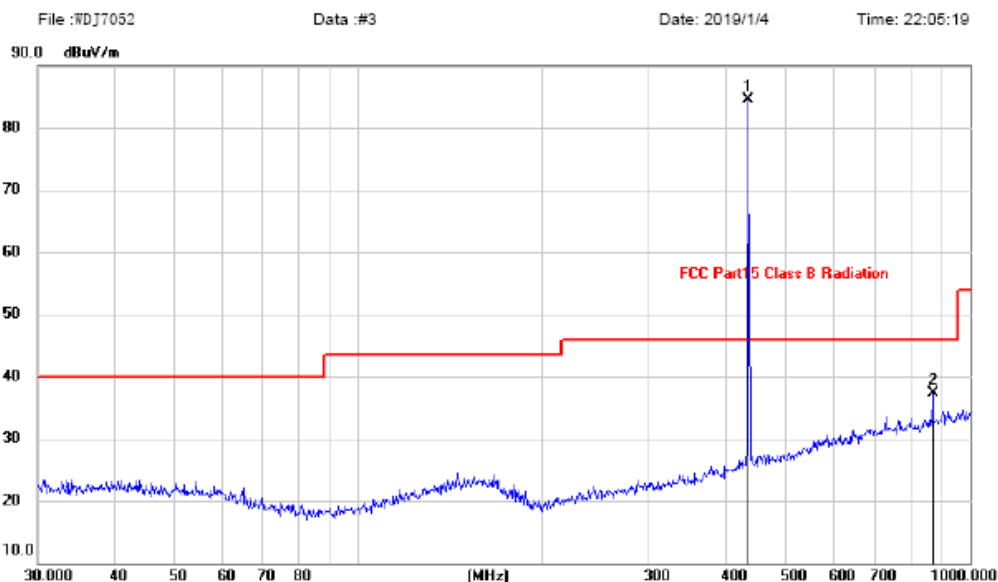
Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Site: LAB  
 Limit: FCC Part15 Class B Radiation  
 EUT:  
 M/N: WDJ7052  
 Mode: Tx  
 Note:  
 Engineer Signature:

Polarization: *Horizontal*  
 Power: DC 3V  
 Distance: 3m

Temperature: 23.9  
 Humidity: 46 %

**Radiated Emission Measurement**



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	434.0651	68.11	16.37	84.48	46.00	38.48	peak	100	0
2		869.1302	14.60	22.69	37.29	46.00	-8.71	peak	100	360

Note: 1. \*:Maximum data; x:Over limit; !:over margin.  
 2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Perform as section 6.4, this equipment is a automatically transmitter, and the transmit cycle time is longer than 30s, single transmit time is 0.945s, so the duty cycle is less than 3.15%, the maximum AVG power for EUT is as below:

Peak Power = 84.48 dBuV/m

AVG Power = Peak Power - 10\*LOG(1/Duty cycle)=69.48dBuV/m <72.87dBuV/m

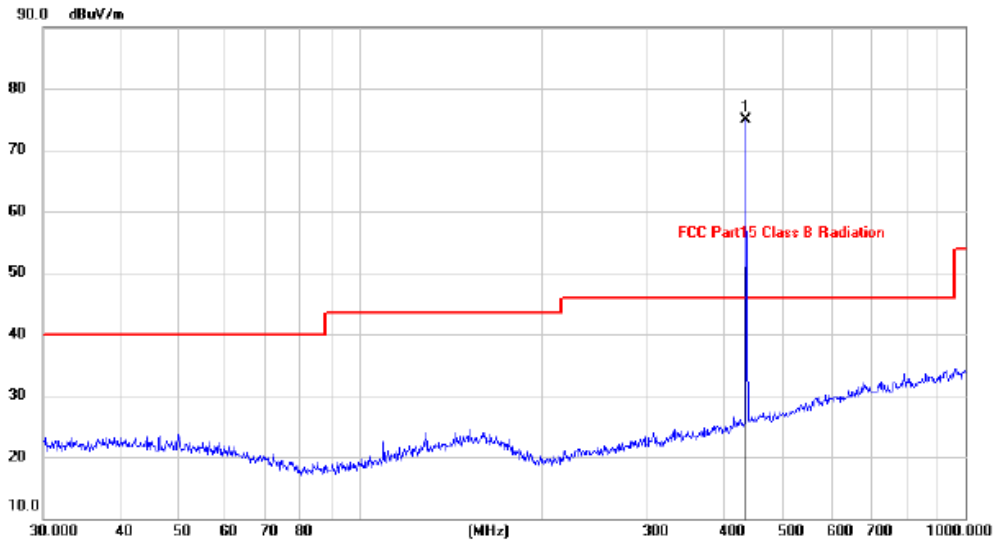
Site: LAB  
 Limit: FCC Part15 Class B Radiation  
 EUT:  
 M/N: WDJ7052  
 Mode: Tx  
 Note:  
 Engineer Signature:

Polarization: *Vertical*  
 Power: DC 3V  
 Distance: 3m

Temperature: 23.9  
 Humidity: 46 %

**Radiated Emission Measurement**

File :WDJ7052      Data :#4      Date: 2019/1/4      Time: 22:08:07



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	434.0651	58.59	16.37	74.96	46.00	28.96	peak	400	360

Note:1. \*:Maximum data; x:Over limit; !:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

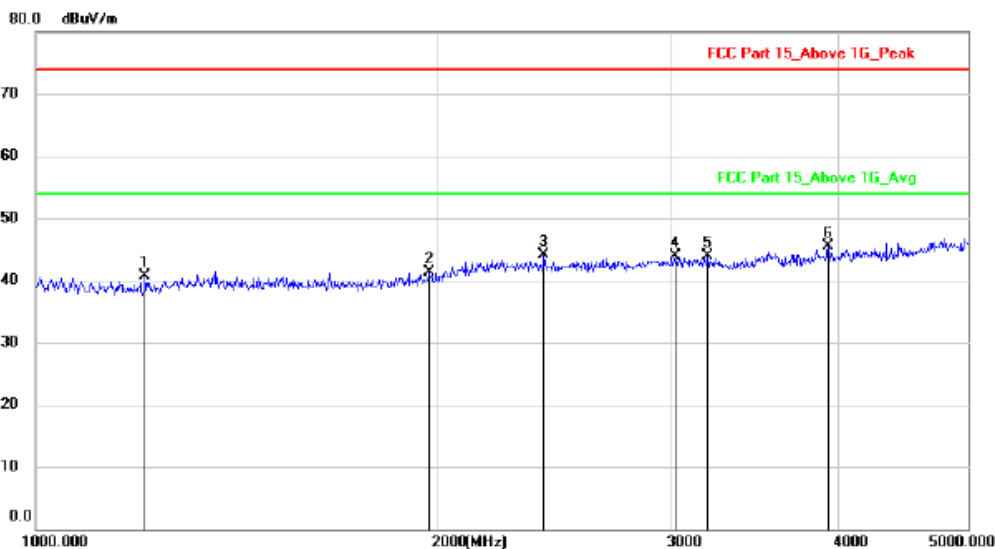
Site LAB  
 Limit: FCC Part 15\_Above 1G\_Peak  
 EUT:  
 M/N: WDJ7052  
 Mode: Tx  
 Note:  
 Engineer Signature:

Polarization: *Vertical*  
 Power: DC 3V  
 Distance: 3m

Temperature: 23.9  
 Humidity: 46 %

**Radiated Emission Measurement**

File :WDJ7052                      Data :#1                      Date: 2019/1/4                      Time: 21:58:19



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		1207.201	48.94	-8.19	40.75	74.00	-33.25	peak	400	0
2		1972.265	46.83	-5.61	41.22	74.00	-32.78	peak	400	360
3		2404.023	47.58	-3.41	44.17	74.00	-29.83	peak	400	360
4		3016.431	46.21	-2.28	43.93	74.00	-30.07	peak	400	0
5		3191.225	46.06	-2.14	43.92	74.00	-30.08	peak	400	0
6	*	3927.575	50.73	-5.29	45.44	74.00	-28.56	peak	400	360

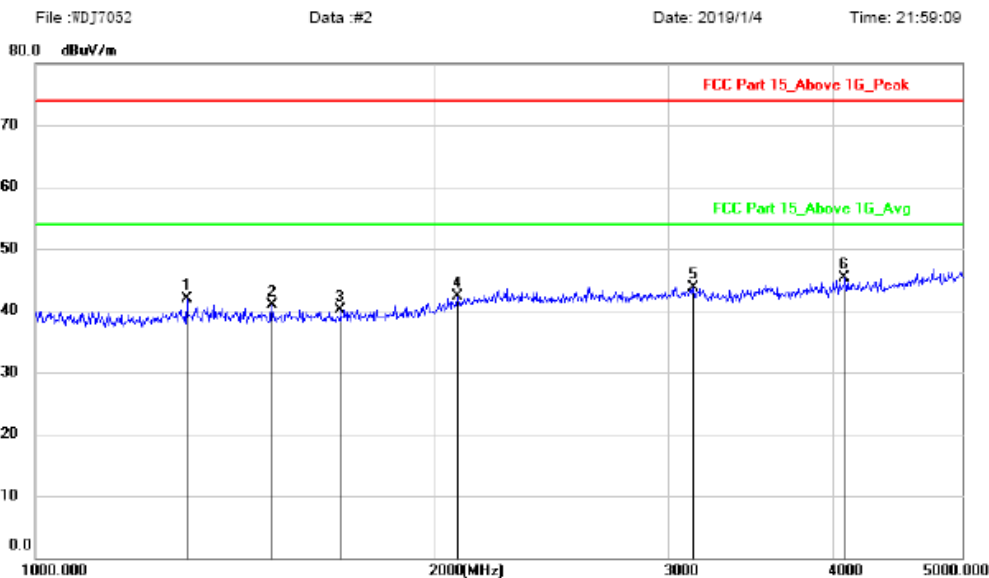
Note:1. \*:Maximum data; x:Over limit; !:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Site LAB  
 Limit: FCC Part 15\_Above 1G\_Peak  
 EUT:  
 M/N: WDJ7052  
 Mode: Tx  
 Note:  
 Engineer Signature:

Polarization: *Horizontal*  
 Power: DC 3V  
 Distance: 3m  
 Temperature: 23.9  
 Humidity: 46 %

**Radiated Emission Measurement**



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1		1299.966	49.29	-7.33	41.96	74.00	-32.04	peak 100	360
2		1507.431	47.91	-6.99	40.92	74.00	-33.08	peak 100	360
3		1698.092	47.04	-6.85	40.19	74.00	-33.81	peak 100	0
4		2079.847	46.73	-4.39	42.34	74.00	-31.66	peak 100	0
5		3135.225	45.74	-2.09	43.65	74.00	-30.35	peak 100	360
6	*	4075.687	50.20	-4.87	45.33	74.00	-28.67	peak 100	360

Note: 1. \*:Maximum data; x:Over limit; !:over margin.  
 2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.



## 4. POWER LINE CONDUCTED EMISSION

### 4.1. Conducted Emission Limits (15.209)

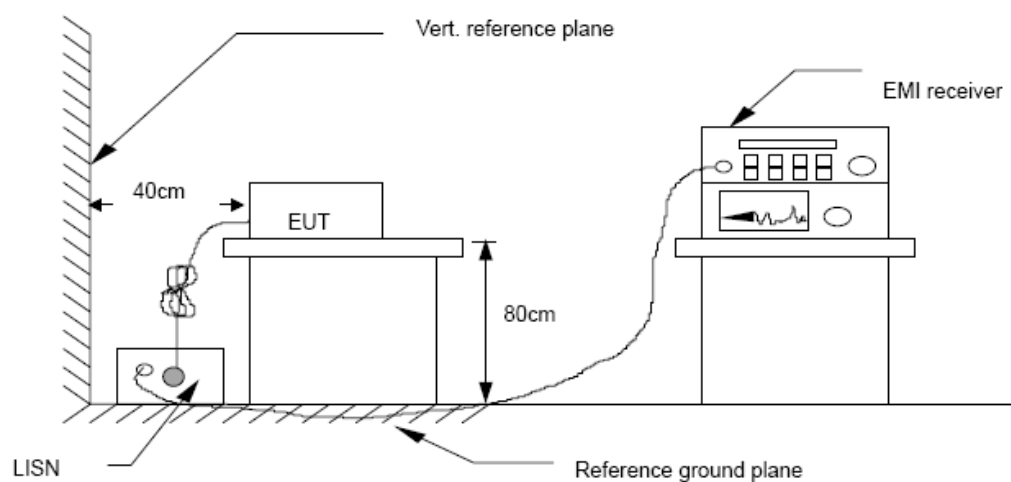
Frequency MHz	Limits dB( $\mu$ V)	
	Quasi-peak Level	Average Level
0.15 -0.50	66 -56*	56 - 46*
0.50 -5.00	56	46
5.00 -30.00	60	50

Notes: 1. \*Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3. The limit decreases in line with the logarithm of the frequency in the rang of 0.15 to 0.50 MHz.

### 4.2. Test Setup



### 4.3. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10:2013 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCI) is set at 9 kHz.

### 4.4. Test Results

EUT power supplies by battery, so the test not applicable.

## 5. Occupied bandwidth

### 5.1. Test limit

Please refer section RSS-210 & 15.231

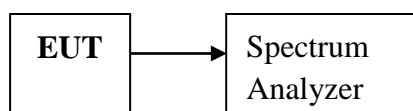
According to §15.231(C), the bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.

### 5.2. Method of measurement

a) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. 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.

b) The test receiver RBW set 30KHz, VBW set 30KHz, Sweep time set auto.

### 5.3. Test Setup

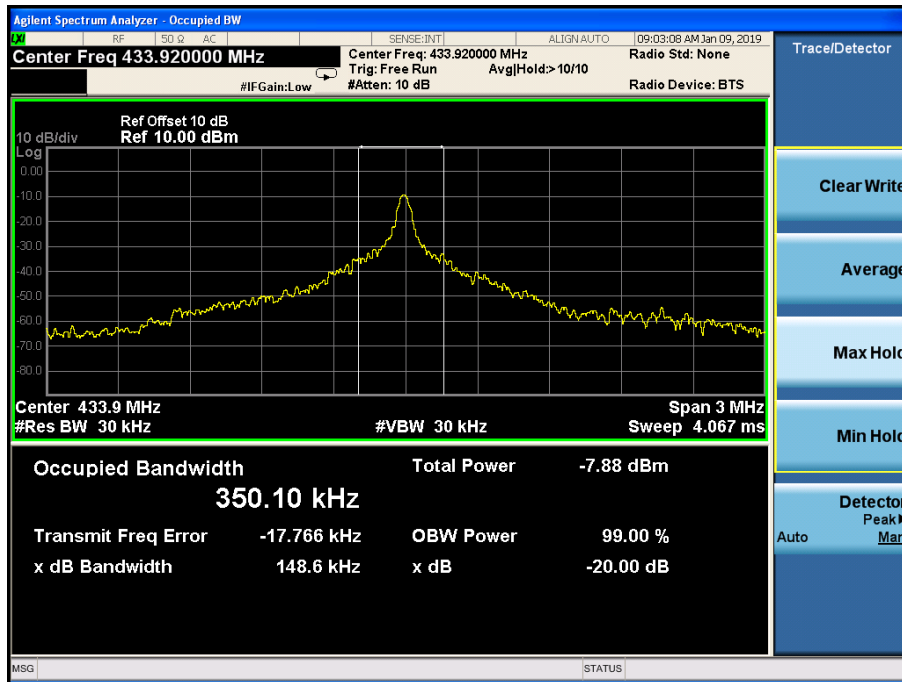


### 5.4. Test Results

Mode	Freq (MHz)	20dB Bandwidth (KHz)	99% Bandwidth	Limit (kHz)	Conclusion
FSK	433.92	148.6	/	1084.8	PASS

Note: Limit = 433.92MHz \* 0.25% = 1084.8 kHz

Plot



## 6. Transmission time

### 6.1. Test limit

Please refer section RSS-210 & 15.231

According to §15.231(e), In addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

### 6.2. Method of measurement

6.2.1. Place the EUT on the table and set it in transmitting mode.

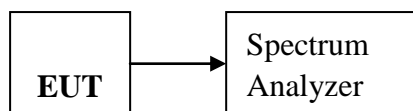
6.2.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

6.2.3. Set spectrum analyzer Center= 433.92MHz, Span = 0MHz, Sweep = 35s.

6.2.4. Set the spectrum analyzer as RBW, VBW=1MHz,

6.2.5. Max hold, view and count how many channel in the band.

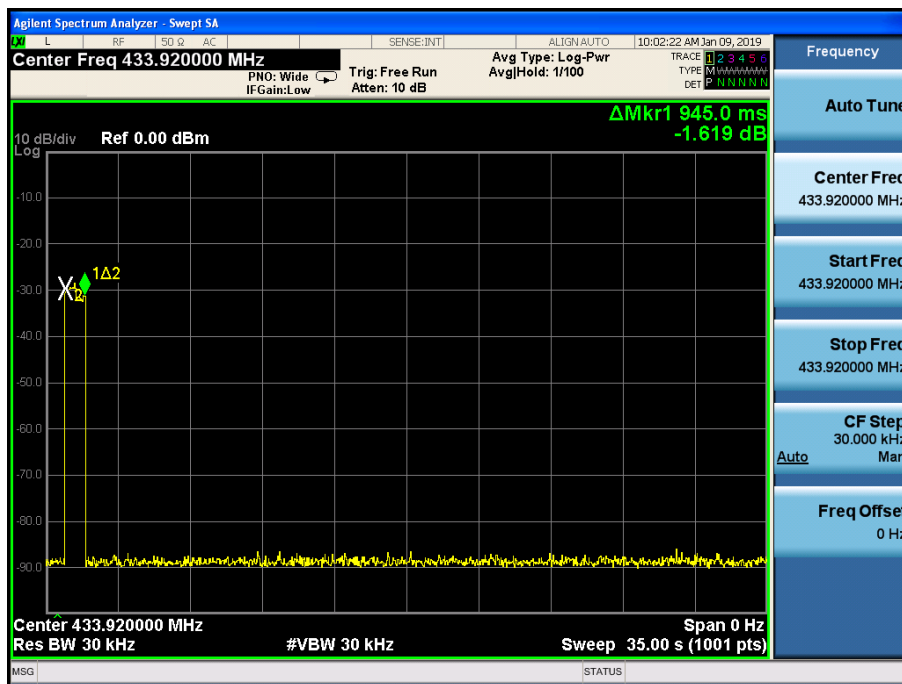
### 6.3. Test Setup



### 6.4. Test Results

Freq (MHz)	Test Result(s)	Conclusion
433.92	0.945	PASS

EUT emission Continue 0.945 seconds, and the silent period is more than 30s, compliance with 15.231 (e) section.



## **7. Antenna Requirement**

### 7.1. Standard 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 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.

### 7.2. Antenna Connected Construction

The directional gains of antenna used for transmitting is 2 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

### 7.3. Result

The EUT antenna is internal antenna. It complies with the standard requirement.