TEST REPORT

FCC ID	: N3ITF3003BMRX
Applicant	: TEAMFORCE CO.,LTD
Address	: 5FL.,No.13 , Pao-kao Rd.,Hsin Tien, Taipei Hsien , Taiwan
Manufacturer	: The same as above
Address	: The same as above

Equipment Under Test (EUT) :

Product Name	: Endoscope, Wireless detachable 3.5" display
Model No.	: TF3003BMRX
Rules	: FCC CFR47 Part 15 Section 15.249: 2010,

Date of Test	: April 19~22, 2013
Date of Issue	: May 10, 2013

Test Result	**: PASS***

Remark:
* The sample described above has been tested to be in compliance with the requirements of the rules listed above.
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company.
The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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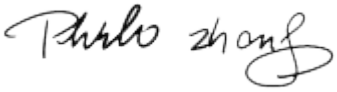
Compiled by:

Zero Zhou / Project Engineer

Approved by:



Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Result
Restricted Band	15.205	PASS
Duty Cycle	15.35(c)	PASS
20dB Bandwidth	15:215(c)	PASS
Conducted Emissions	15.207	PASS
Radiated Emissions	15.205(a) 15.209 15.249(a)	PASS
Antenna Requirement	15.203	PASS

3 Contents

4 General Information

4.1 General Description of E.U.T.

Product Name	: Endoscope, Wireless detachable 3.5" display
Model No.	: TF3003BMRX
Type of Modulation	: FM
Frequency Range	: 2414 MHz
Oscillator	: 8MHz
Antenna Gain	: 2dBi
Antenna installation	: Integrated Antenna

4.2 Details of E.U.T.

Technical Data	: 4*1.5V AA battery, max 450mA or DC 5V, 0.5A powered by external adapter input (adapter input: AC 100-240V, 50-60Hz, 0.15A)
Adapter manufacturer	: GME
M/N	: GME031T-050050

4.3 Description of Support Units

No.	Equipment	Manufacturer	Model No.	Series No.
1	LCD TV	Skyworth	22S11HR	-
2	Notebook	IBM	2672-39C	99-8D3W4

4.4 Test Facility

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

- **FCC – Registration No.: 880581**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, May 26, 2011.

- **IC – Registration No.:7760A**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, July 12, 2012.

4.5 Test Location

All Emissions testswere performed at:-
1/F, Fukangtai Building,West Baima Rd.,Songgang Street, Baoan District, Shenzhen 518105, Guangdong,China.

4.6 General condition

Ambient Condition: 25.5 ℃ 58 %RH

4.6.1 Environmental condition of test site

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

The follow condition is not applicable

Test Voltage	Input voltage
Rated voltage-15%	
normal	
Rated voltage+15%	

The follow condition is applicable.

Test voltage	Test Voltage
Rated voltage	New Battery 6V DC

4.6.2 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Lower channel	Middle channel	Upper channel
Transmitting	MHz	2414MHz	MHz
Receiving	MHz	MHz	MHz

Conducted emissions	charging
Radiated emissions	Charging
	DVRC

5 Equipment Used during Test

5.1 Equipments List

Conducted Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	101155	Aug. 13,2012	Aug. 12,2013
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Aug. 13,2012	Aug. 12,2013
3.	Cable	LARGE	RF300	EW02014-3	Aug.14,2012	Aug. 13,2013
3m Semi-anechoic Chamber for Radiation(TDK) (Test Frequency:32.768kHz~1000MHz)						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	Aug.09,2012	Aug.09,2013
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Aug. 13,2012	Aug. 12,2013
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Aug.11,2012	Aug.11,2013
4	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Apr.07,2013	Apr.07,2014
5	Cable	HUBER+SUHNER	CBL2	525178	Sep.15,2012	Sep.15,2013
3m Semi-anechoic Chamber for Radiation Emissions (Test Frequency:Above 1GHz)						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMC Analyzer	Agilent	E7405A	MY45114943	Aug. 13,2012	Aug. 13,2013
2.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Aug. 13,2012	Aug. 13,2013
3.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	399	Aug. 13,2012	Aug. 13,2013
4.	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Apr.07,2013	Apr.07,2014
5.	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-148	Aug. 13,2012	Aug. 13,2013
6.	10m Coaxial Cable with N- plug	SCHWARZBECK	AK 9515 H	-	Aug. 13,2012	Aug. 13,2013

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 1 x 10^{-6}
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 4.74 dB (Horn antenna 1000M~25000MHz)
Conducted Spurious Emissions test	± 3.64 dB (AC mains 150KHz~30MHz)

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

6 Conducted Emission Test

Test Requirement:	FCC Part15 Paragraph 15.207
Test Method:	ANSI C63.4
Frequency Range:	150kHz to 30MHz
Class:	Class B
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)
	Quasi-Peak & Average if maximised peak within 6dB of Average
Limit	66-56 dBμV between 0.15MHz & 0.5MHz
	56 dBμV between 0.5MHz & 5MHz
	60 dBμV between 5MHz & 30MHz

6.1 E.U.T. Operation

Operating Environment:

Temperature:	25.5 °C
Humidity:	51 % RH
Atmospheric Pressure:	1012 mbar

EUT Operation:

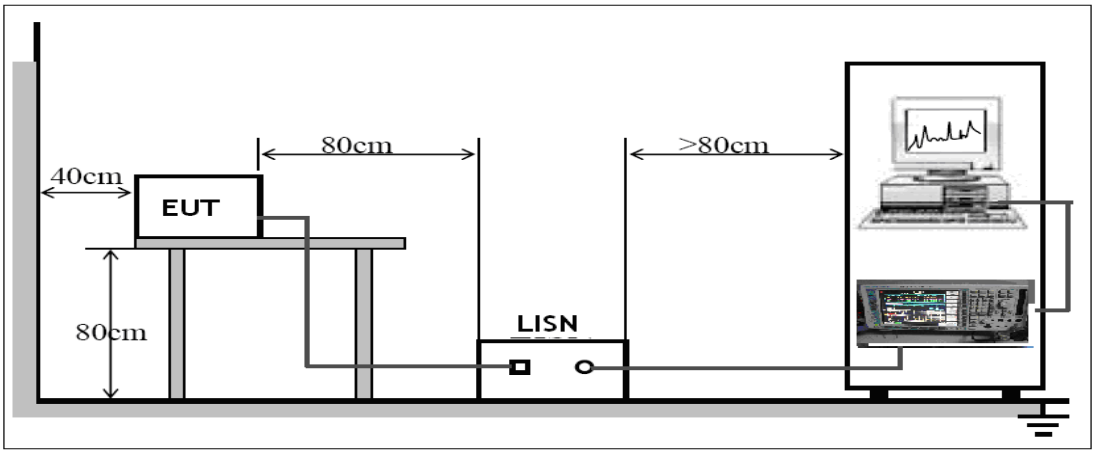
The test was performed in charging mode, the test data were shown in the report.

The EUT was tested according to ANSI C63.4:2003. The frequency spectrum from 150kHz to 30MHz was investigated.

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.2 EUT Setup

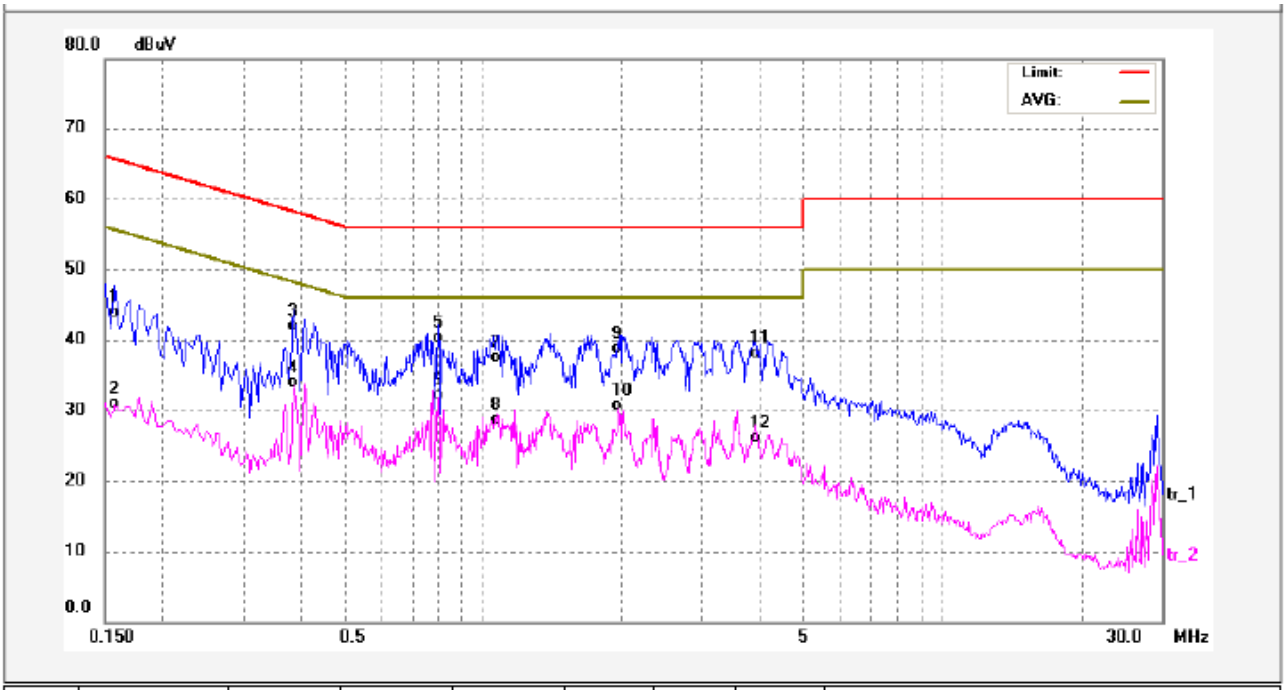
The EUT was placed on the test table in shielding room.



6.3 Conducted Emission Test Result

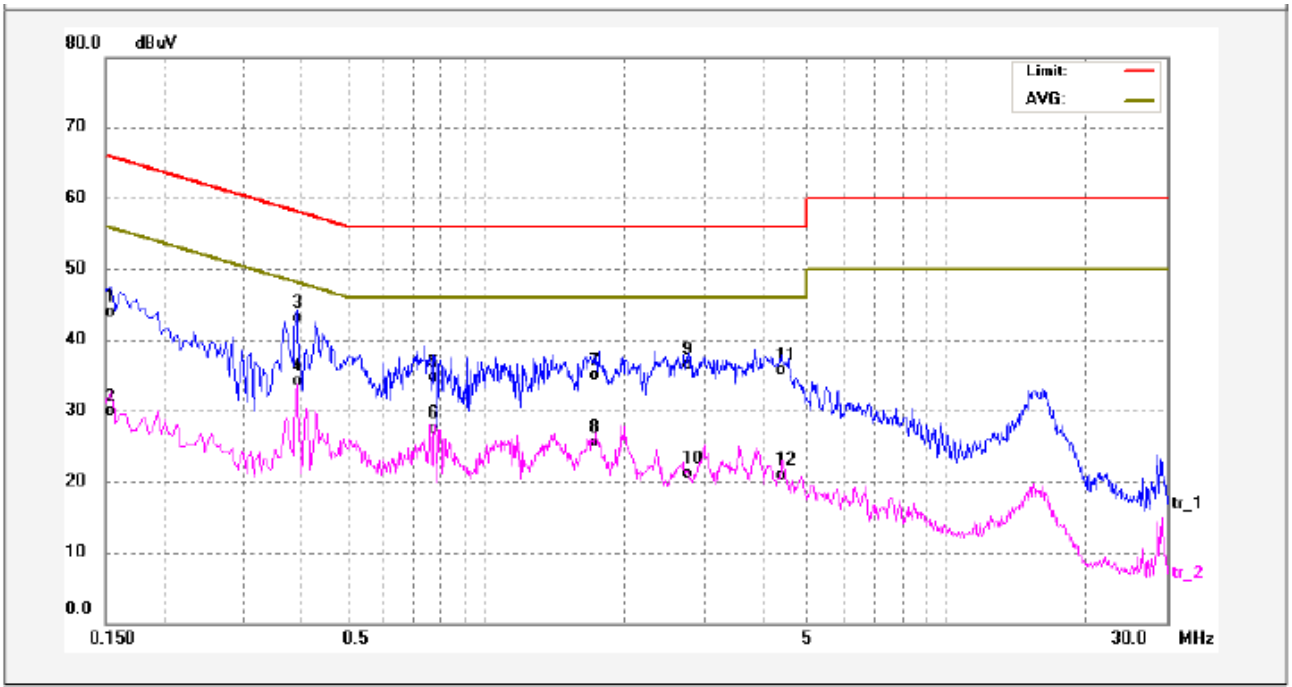
An initial pre-scan was performed on the live and neutral lines.

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1580	31.85	11.19	43.04	65.56	-22.52	QP	
2	0.1580	18.99	11.19	30.18	55.56	-25.38	AVG	
3	0.3860	29.76	11.31	41.07	58.15	-17.08	QP	
4	0.3860	21.86	11.31	33.17	48.15	-14.98	AVG	
5	0.7980	28.29	11.29	39.58	56.00	-16.42	QP	
6	0.7980	20.04	11.29	31.33	46.00	-14.67	AVG	
7	1.0740	25.44	11.18	36.62	56.00	-19.38	QP	
8	1.0740	16.72	11.18	27.90	46.00	-18.10	AVG	
9	1.9820	26.69	11.20	37.89	56.00	-18.11	QP	
10	1.9820	18.62	11.20	29.82	46.00	-16.18	AVG	
11	3.9220	25.98	11.23	37.21	56.00	-18.79	QP	
12	3.9220	14.07	11.23	25.30	46.00	-20.70	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1539	31.91	11.18	43.09	65.78	-22.69	QP	
2	0.1539	17.99	11.18	29.17	55.78	-26.61	AVG	
3	0.3899	31.01	11.31	42.32	58.06	-15.74	QP	
4	0.3899	22.01	11.31	33.32	48.06	-14.74	AVG	
5	0.7740	22.56	11.30	33.86	56.00	-22.14	QP	
6	0.7740	15.49	11.30	26.79	46.00	-19.21	AVG	
7	1.7620	22.83	11.20	34.03	56.00	-21.97	QP	
8	1.7620	13.57	11.20	24.77	46.00	-21.23	AVG	
9	2.7659	24.48	11.21	35.69	56.00	-20.31	QP	
10	2.7659	9.08	11.21	20.29	46.00	-25.71	AVG	
11	4.3620	23.63	11.23	34.86	56.00	-21.14	QP	
12	4.3620	8.91	11.23	20.14	46.00	-25.86	AVG	

7 Radiation Emission Test

Test Requirement: FCC Part15 Paragraph 15.249

Test Method: ANSI 63.4

Measurement Distance: 3m

Detector: Peak for pre-scan (120kHz resolution bandwidth)

Quasi-Peak if maximised peak within 6dB of limit

Test Result: PASS

15.249(a)Limit:

Fundamental frequency	Field strength of fundamental		Field strength of harmonics	
	mV/m	dBuV/m	uV/m	dBuV/m
902-928 MHz	50	94	500	54
2400-2483.5 MHz	50	94	500	54
5725-5875 MHz	50	94	500	54
24.0-24.25 GHz	250	108	2500	68

15.209 Limit:

Frequency(MHZ)	Distance(m)	Field strength	
		uV/m	dBuV/m
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
Above 960	3	500	54.0

Note: RF Voltage(dBuV)=20 $\log_{10}$ RF Voltage(uV)

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the funda-mental or to the general radiated emis-sion limits in §15.209, whichever is the lesser attenuation.

7.1 EUT Operation:

Operating Environment:

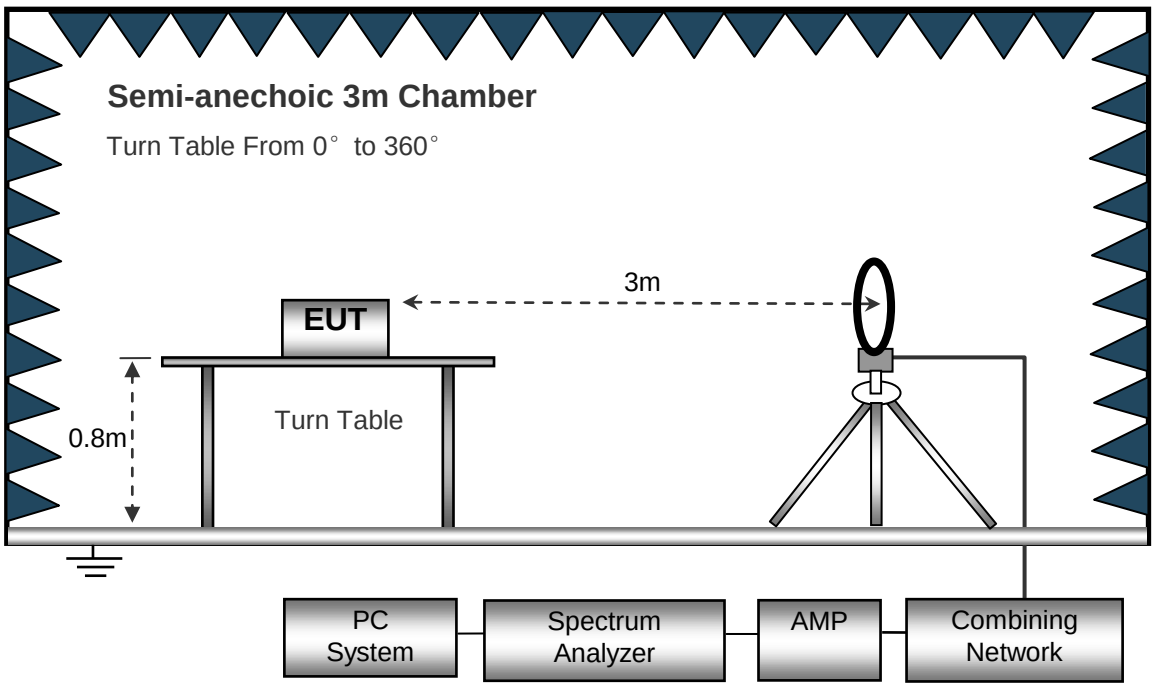
Temperature: 25.5 °C
Humidity: 51 % RH
Atmospheric Pressure: 1012 mbar

Operation Mode:

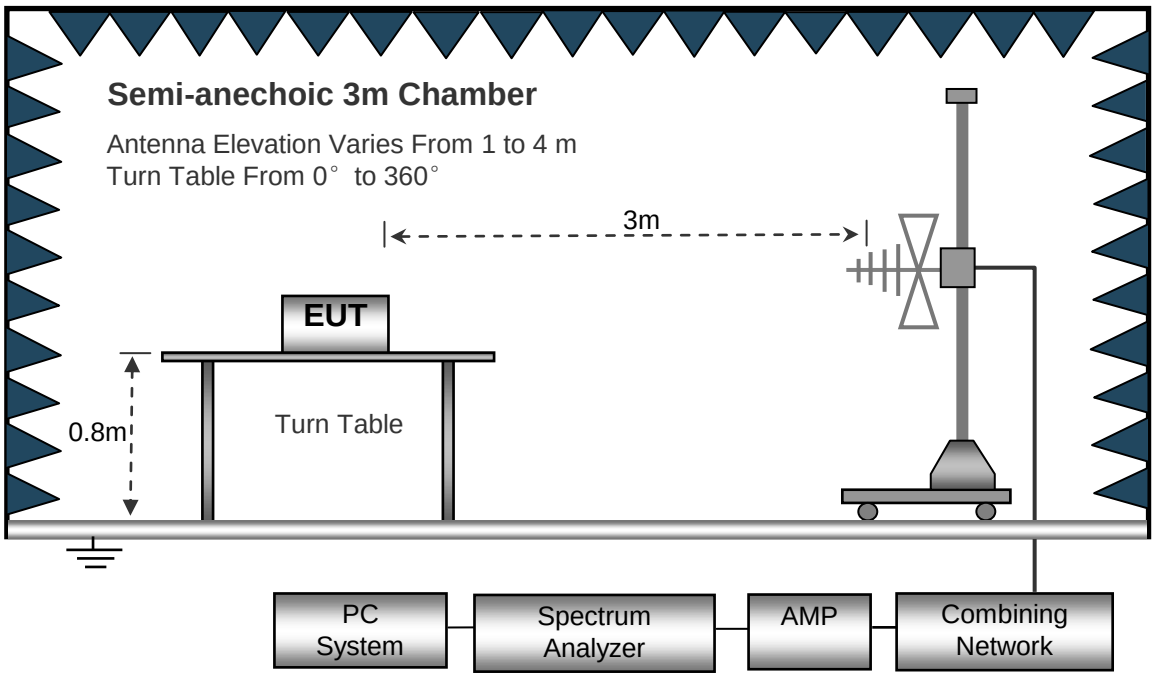
The EUT was tested in charging, DVR C mode. The test data were shown as follow.

7.2 Test Setup

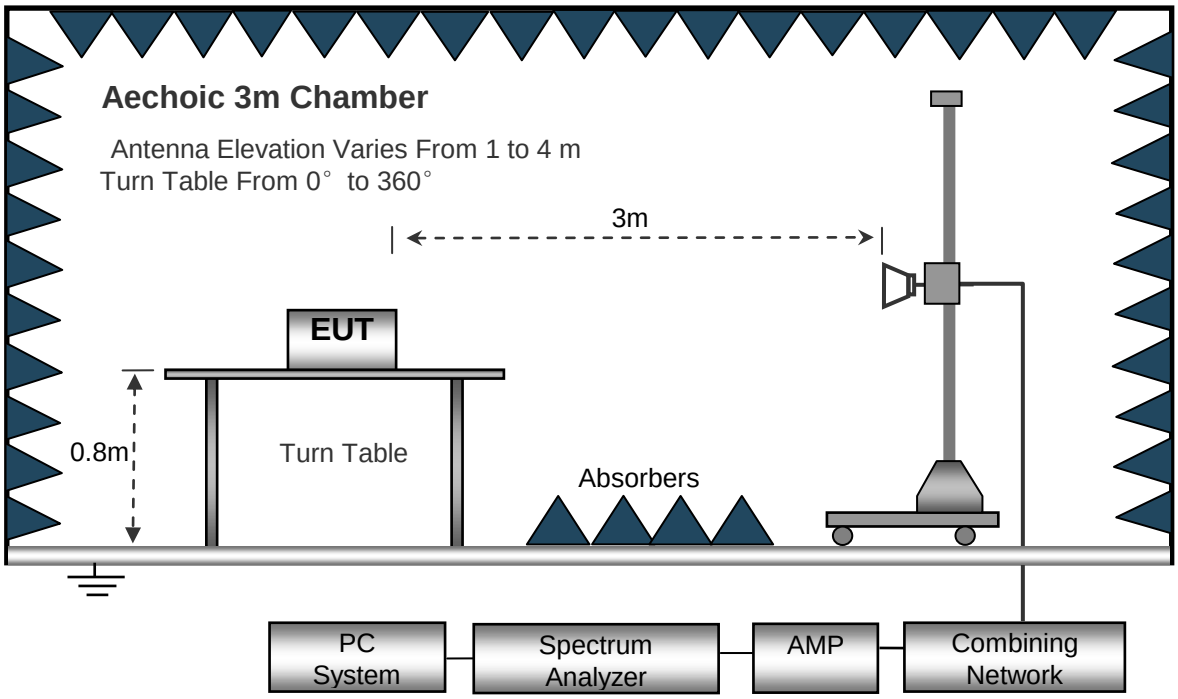
The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2003.
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

According to FCC Part15 Rules, the system was tested from 8MHz to 25GHz.

Below 30MHz

Sweep Speed .....Auto
IF Bandwidth 10KHz
Video Bandwidth.....10KHz

Resolution Bandwidth.....10KHz

30MHz ~ 1GHz

Sweep Speed .....Auto
IF Bandwidth .....120 KHz
Video Bandwidth.....100KHz
Quasi-Peak Adapter Bandwidth .....120 KHz
Quasi-Peak Adapter Mode .....Normal
Resolution Bandwidth.....100KHz

Above 1GHz

Sweep Speed .....Auto
IF Bandwidth .....120 KHz
Video Bandwidth.....3MHz
Quasi-Peak Adapter Bandwidth .....120 KHz
Quasi-Peak Adapter Mode .....Normal
Resolution Bandwidth.....1MHz

7.4 Test Procedure

1. The adapter was used in the equipment under test for radiated emissions test.
2. This is a handhold device,The radiation emission should be tested under 3-axes(X,Y,Z) position(X denotes lying on the table,Y denotes side stand and Z denotes vertical stand),After pre-test,It was found that the worse radiation emission was get at the X position.
   So the data shown was the X position only.
3. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.
4. All data was recorded in the peak and average detection mode.
5. The EUT was under working mode during the final qualification test and the configuration was used to represent the worst case results.

7.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor – Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Class B Limit

7.6 Radiated Emissions Test Result

Formula of conversion factors:the field strength at 3m was egtablished by adding
The meter reading of the spectrum analyzer (which is set to read in units of dBuV/m)
To the antenna correction factor supplied by the antenna manufacturer. The antenna
Correction factors are stared in terms of dB.The gain of the pressletor was accounted
For in the spectrum analyser meter reading.

Example:

Freq(MHz)	Meter Reading +ACF=FS
33	20dBuV+10.36dB=30.36dBuV/m @3m

7.7 Radiated Emission Data

Test Frequency: Below 30MHz

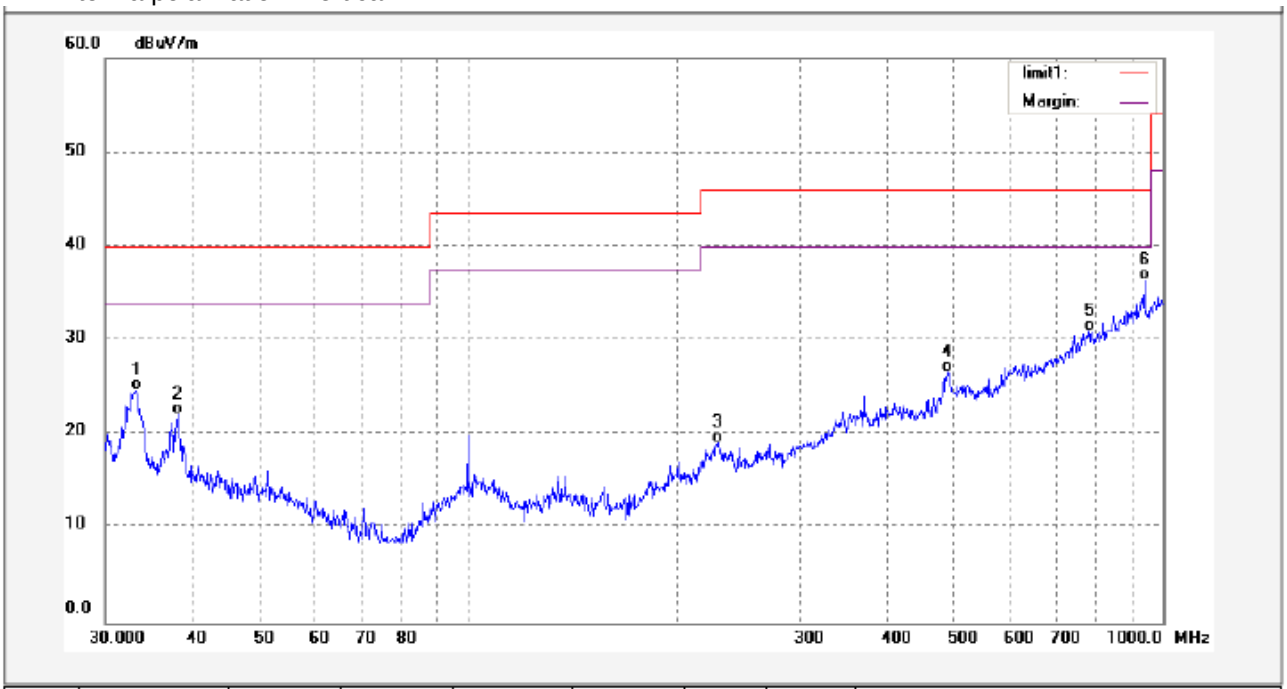
Test Mode: Data Transmitting Mode and DVR C Mode (Battery)

Remarks: All emissions were more than 20 dB below the limit and therefore not reported.

Test Frequency: 30MHz ~ 1000MHz

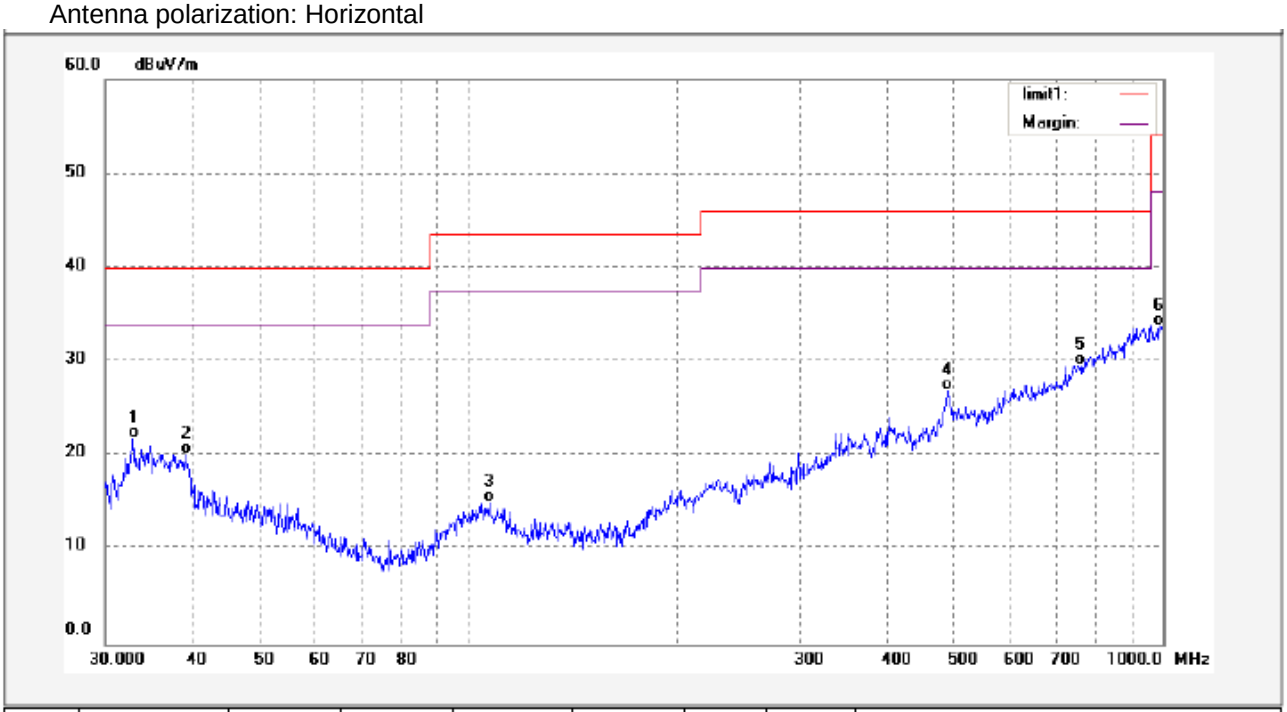
Test Mode: Charging Mode (Adapter)

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	33.2180	8.16	16.56	24.72	40.00	-15.28	QP	
2	38.0965	5.50	16.68	22.18	40.00	-17.82	QP	
3	228.6173	2.87	16.25	19.12	46.00	-26.88	QP	
4	490.0451	0.94	25.75	26.69	46.00	-19.31	QP	
5	781.9606	1.83	29.08	30.91	46.00	-15.09	QP	
6	942.0180	4.66	31.77	36.43	46.00	-9.57	QP	

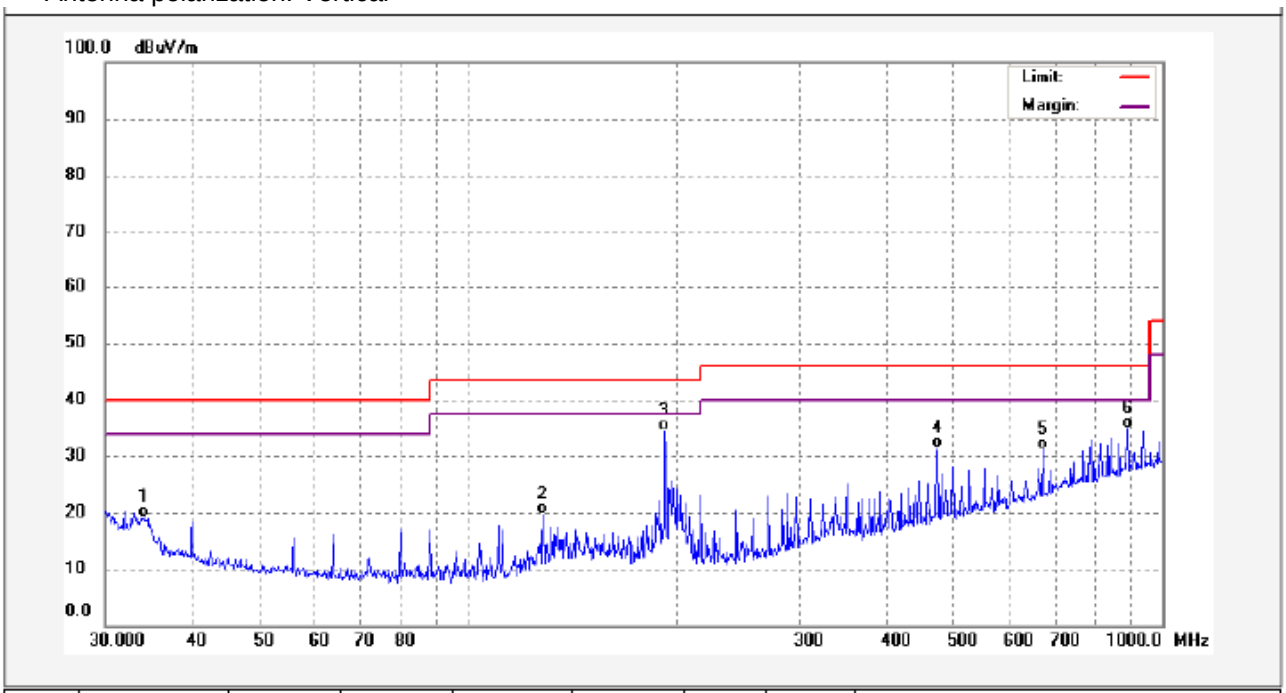
Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	32.8697	5.24	16.57	21.81	40.00	-18.19	QP	
2	39.0451	3.83	16.35	20.18	40.00	-19.82	QP	
3	107.0306	1.05	14.05	15.10	43.50	-28.40	QP	
4	490.0451	1.24	25.75	26.99	46.00	-19.01	QP	
5	757.6201	1.65	28.03	29.68	46.00	-16.32	QP	
6	989.5146	1.56	32.29	33.85	54.00	-20.15	QP	

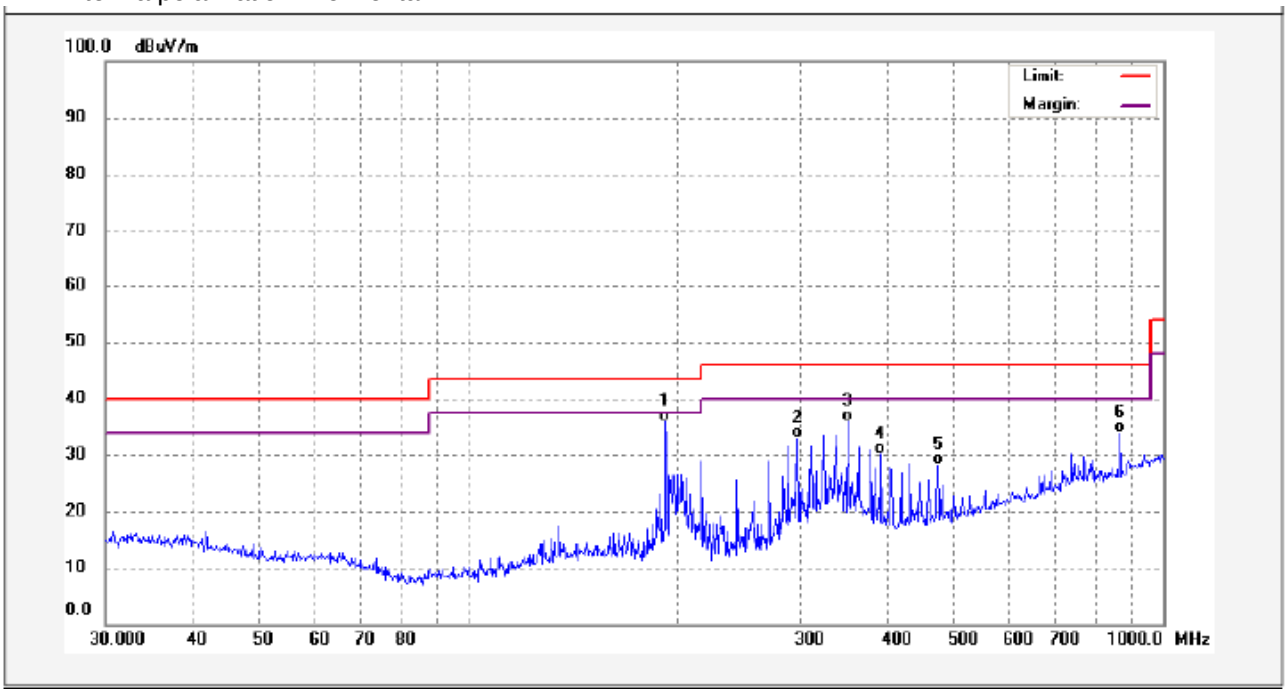
Test Mode: DVR C Mode (Battery)

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	34.0365	39.03	-19.94	19.09	40.00	-20.91	QP	
2	128.1130	42.08	-22.46	19.62	43.50	-23.88	QP	
3	191.7450	57.78	-23.29	34.49	43.50	-9.01	QP	
4	473.8347	46.43	-14.96	31.47	46.00	-14.53	QP	
5	672.8444	41.32	-10.16	31.16	46.00	-14.84	QP	
6	890.7278	40.67	-5.70	34.97	46.00	-11.03	QP	

Antenna polarization: Horizontal

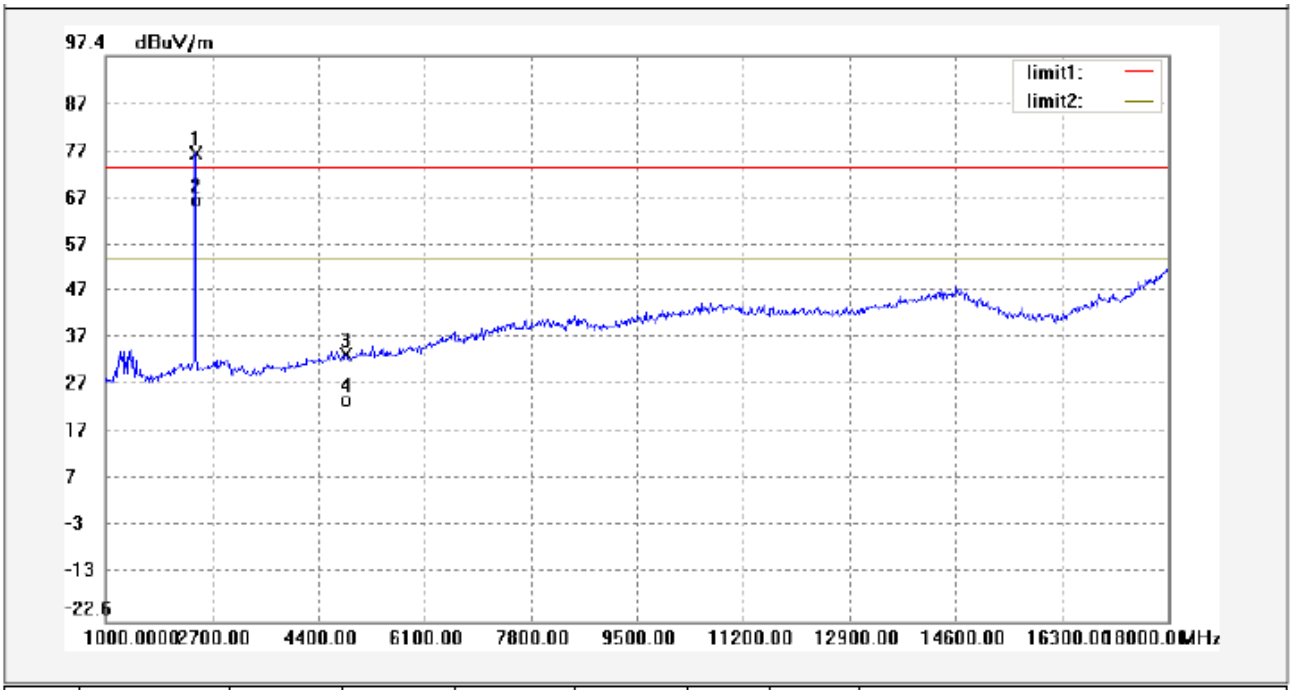


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	191.7450	59.31	-23.33	35.98	43.50	-7.52	QP	
2	297.2240	52.55	-19.74	32.81	46.00	-13.19	QP	
3	351.7079	54.01	-18.16	35.85	46.00	-10.15	QP	
4	392.0950	47.18	-16.97	30.21	46.00	-15.79	QP	
5	473.8346	42.97	-14.79	28.18	46.00	-17.82	QP	
6	866.0879	40.47	-6.54	33.93	46.00	-12.07	QP	

Test Frequency: 1-18GHz

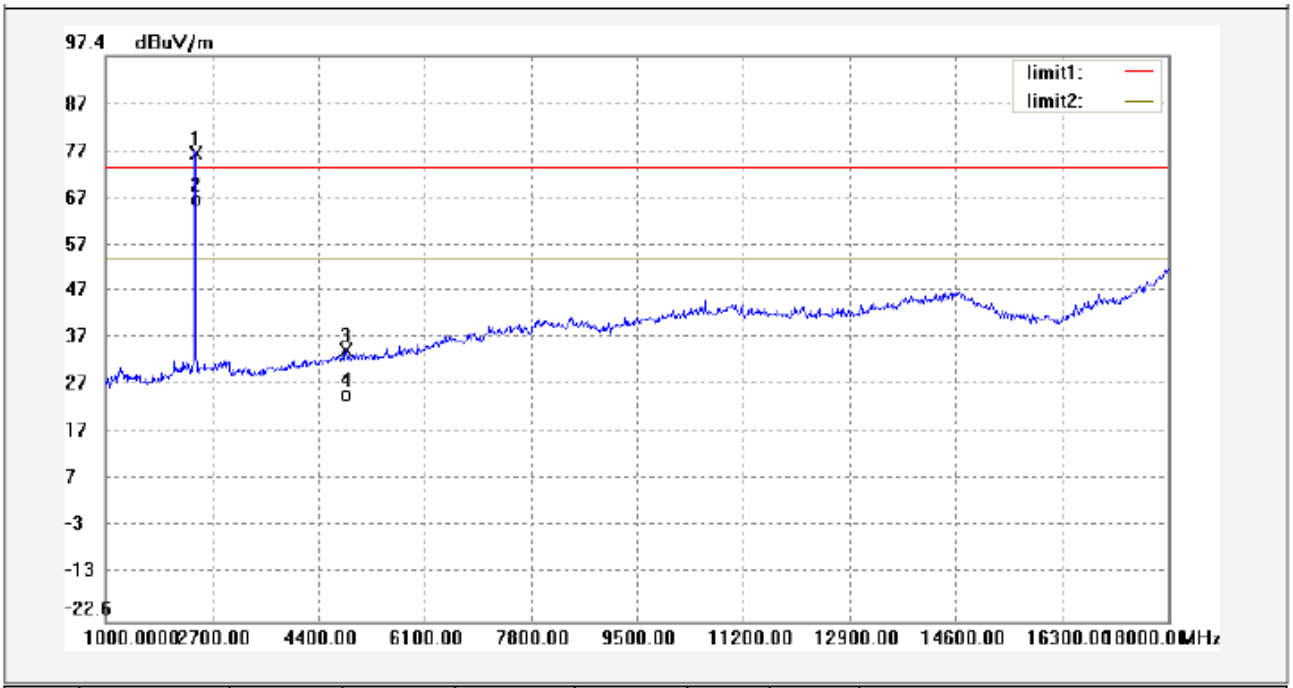
Test Mode:TX Mode

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2414.000	92.59	-15.62	76.97	114.00	-30.03	peak	
2	2414.000	81.23	-15.62	65.61	94.00	-28.39	AVG	
3	4828.000	46.01	-11.95	34.06	74.00	-39.94	peak	
4	4828.000	35.06	-11.95	23.11	54.00	-30.89	AVG	

Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2414.000	92.58	-15.62	76.96	114.00	-37.04	peak	
2	2414.000	81.67	-15.62	66.05	94.00	-27.95	AVG	
3	4828.000	46.94	-11.95	34.99	74.00	-39.01	peak	
4	4828.000	36.19	-11.95	24.24	54.00	-29.76	AVG	

Test Frequency:Above 1GHz

All emissions were more than 20 dB below the limit and therefore not reported.

8 20dB Bandwidth

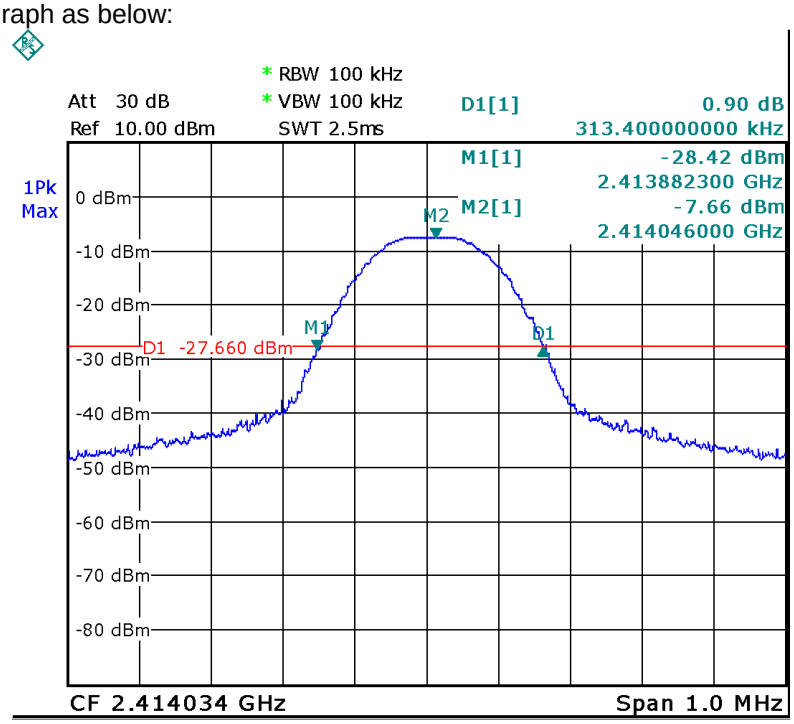
Test Requirement:	FCC Part15.215(c)
Test Method:	ANSI C63.4
Test mode:	Transmitting
Test Result:	PASS

8.1 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. The bandwidth of the fundamental frequency was measure by spectrum analyser with 100KHz RBW and 100KHz VBW.

8.2 Test Result

Please refer the graph as below:



9 Duty Cycle

Test Requirement: FCC Part 15.35(c)

Test Mothed: ANSI C63.4:2003

9.1 Test Result

The duty cycle is 100%.

10 Restricted band

Test Requirement: Radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) and 15.205(c).

Measurement Distance: 3m

Detector: For Peak value:

RBW = 1MHz

VBW =3MHz; Sweep = auto

Detector function = peak

Trace = max hold

For Average value:

RBW = 1MHz

VBW=10Hz; Sweep = auto

Detector function = Average

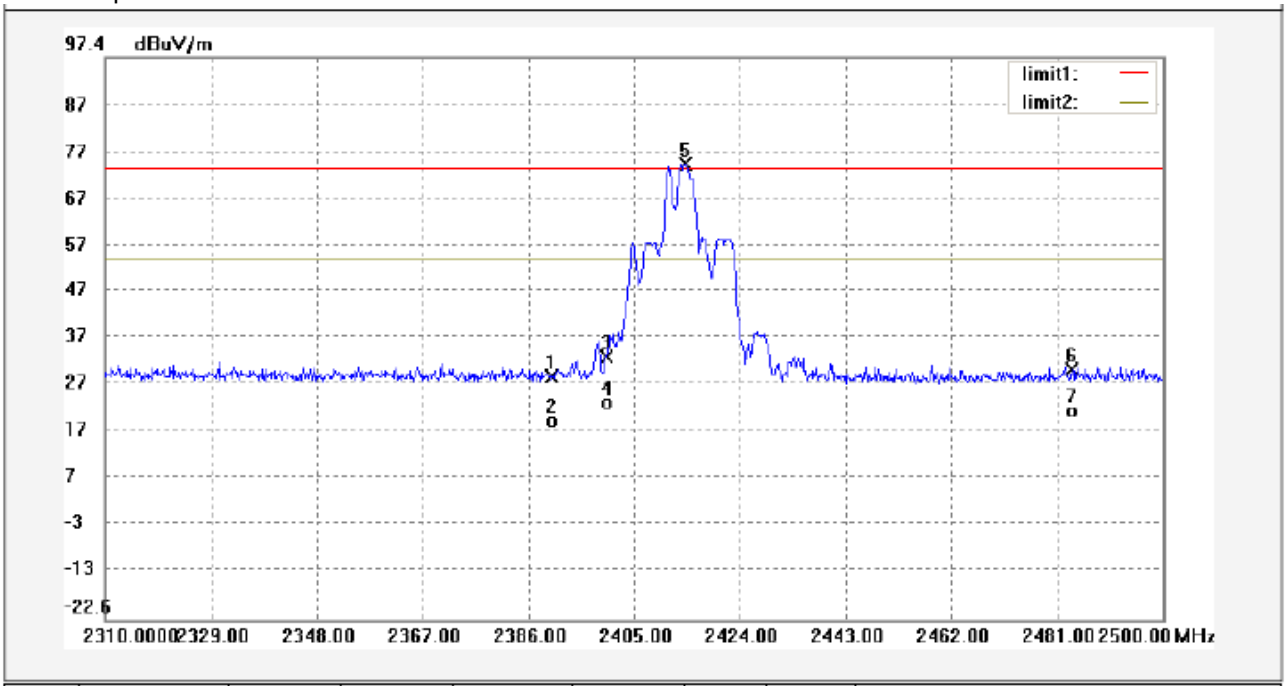
Trace = max hold

10.1 Test Produce

1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

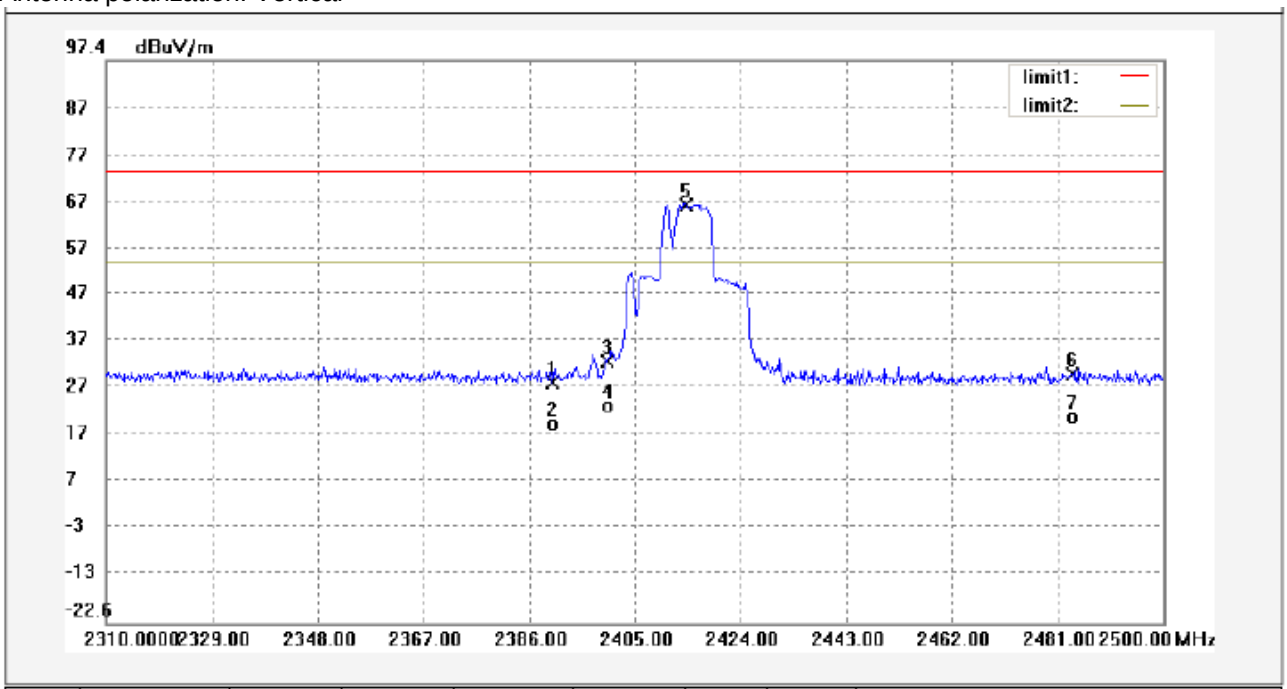
10.2 Test Result

Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2390.000	44.70	-15.55	29.15	74.00	-44.85	peak	
2	2390.000	34.29	-15.55	18.74	54.00	-35.26	AVG	
3	2400.000	48.80	-15.58	33.22	74.00	-40.78	peak	
4	2400.000	38.09	-15.58	22.51	54.00	-31.49	AVG	
5	2414.000	90.49	-15.62	74.87	74.00	0.87	peak	
6	2483.500	46.26	-15.67	30.59	74.00	-43.41	peak	
7	2483.500	36.43	-15.67	20.76	54.00	-33.24	AVG	

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2390.000	44.01	-15.55	28.46	74.00	-45.54	peak	
2	2390.000	34.06	-15.55	18.51	54.00	-35.49	AVG	
3	2400.000	48.74	-15.58	33.16	74.00	-40.84	peak	
4	2400.000	38.16	-15.58	22.58	54.00	-31.42	AVG	
5	2414.000	82.32	-15.62	66.70	74.00	-7.30	peak	
6	2483.500	45.98	-15.67	30.31	74.00	-43.69	peak	
7	2483.500	35.89	-15.67	20.22	54.00	-33.78	AVG	

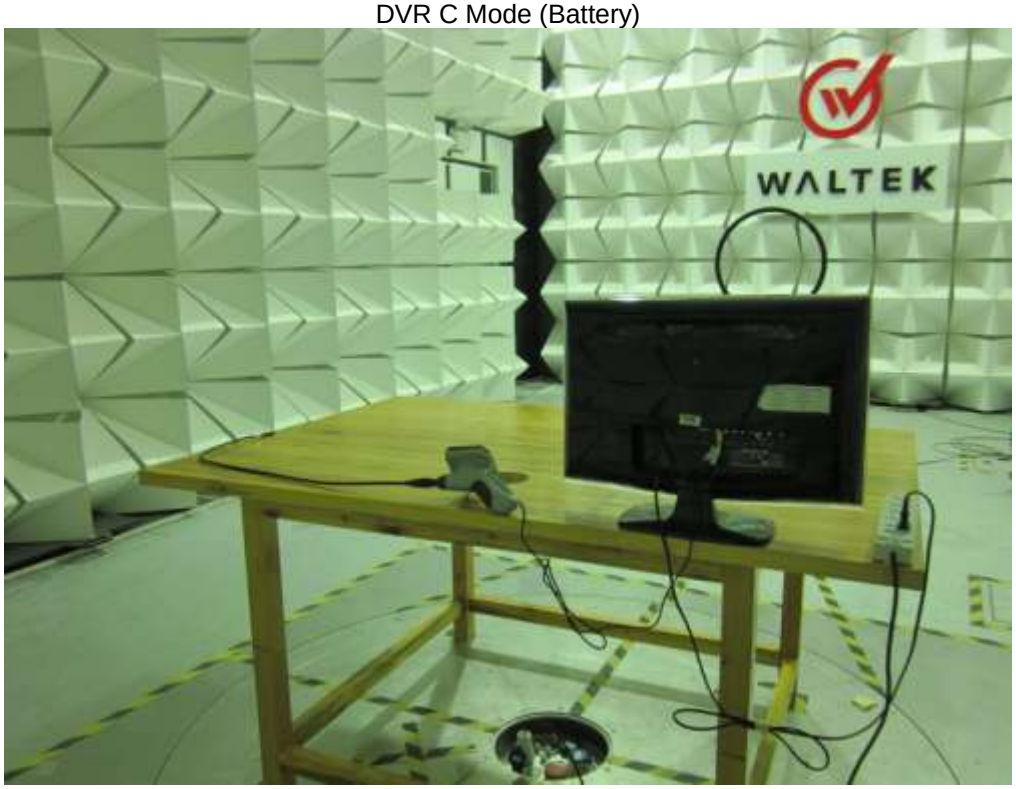
11 Antenna Requirement

According to the FCC Part 15 Paragraph 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. This product has a integrated antenna, fulfil the requirement of this section.

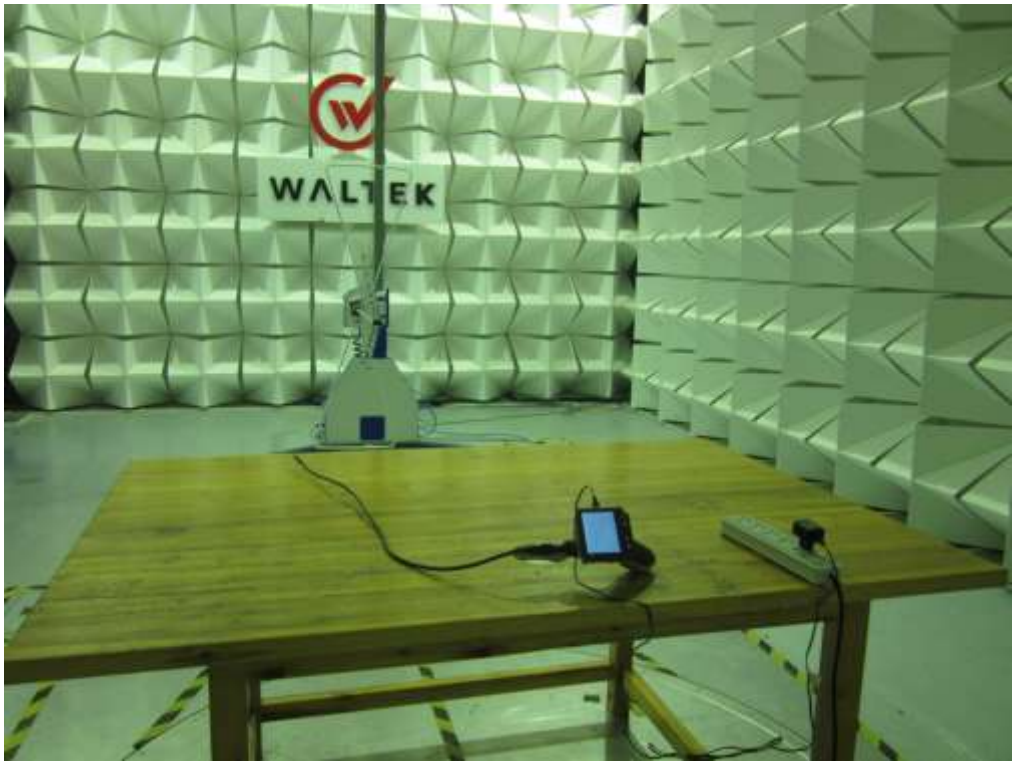
12 Photographs of Testing

12.1 Radiation Emission Below 30MHz

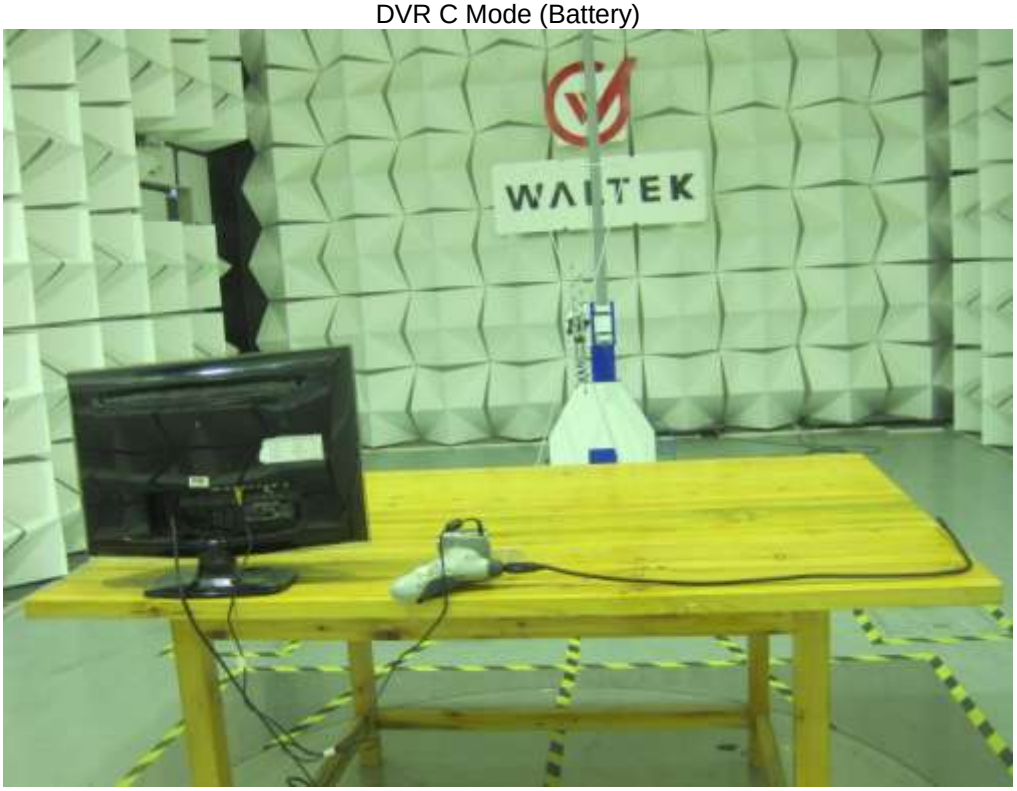
DVR C Mode (Battery)



12.2 Radiation Emission From 30MHz-1GHz



DVR C Mode (Battery)

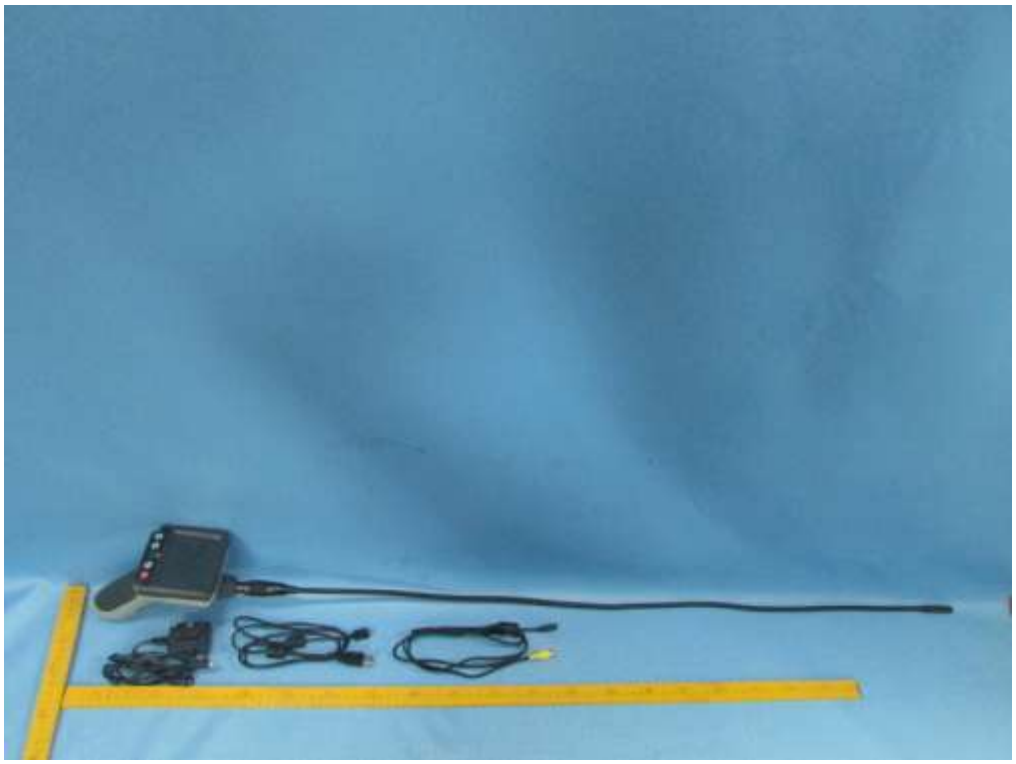


12.3 Radiation Emission Above 1GHz

12.4 Conduction Emission Above 1GHz

13 Photographs - Constructional Details

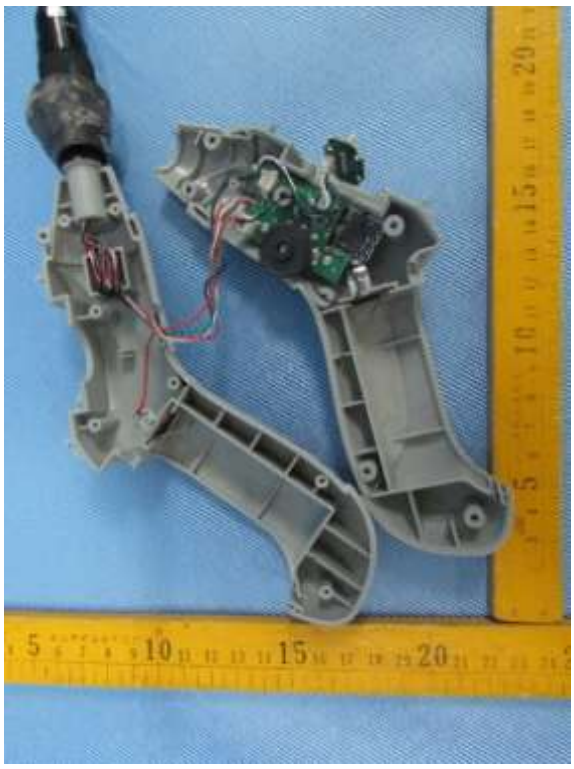
13.1 EUT - Appearance View

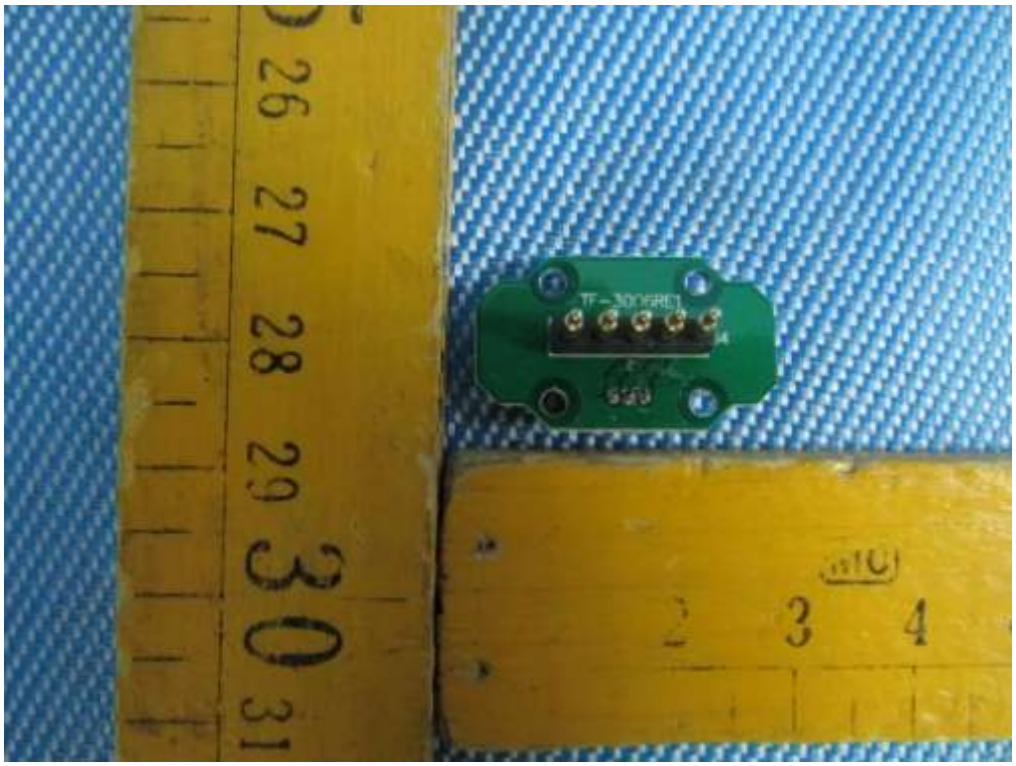


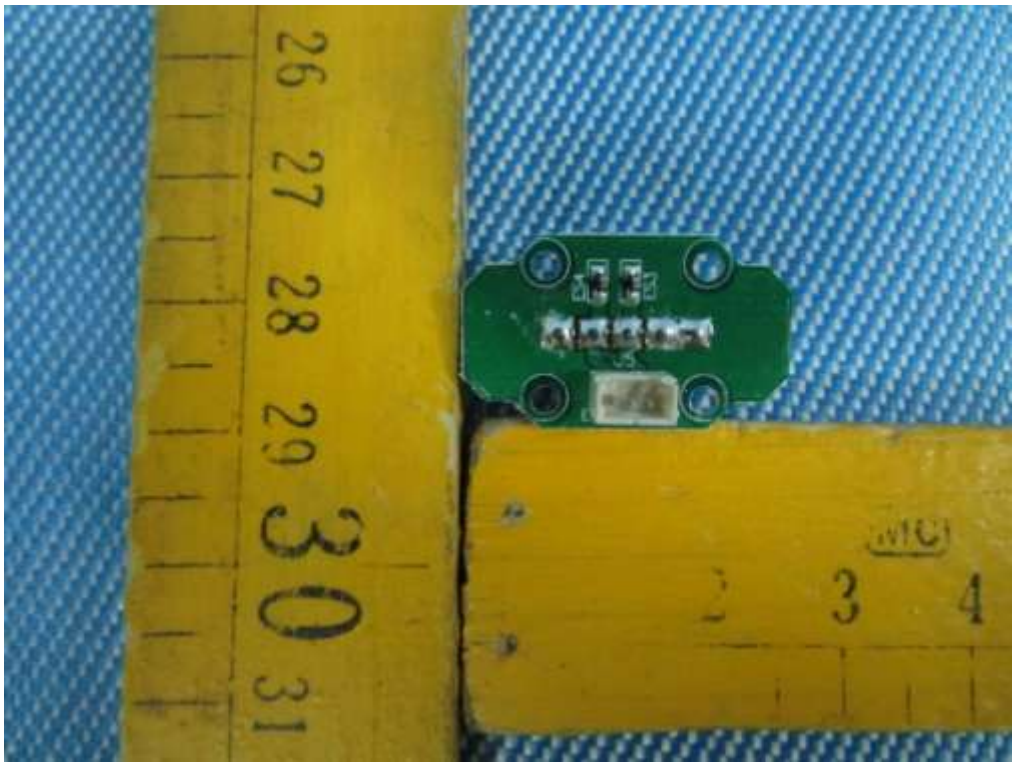
The monitor is a receiver which has applied the Declaration of Conformity procedure.

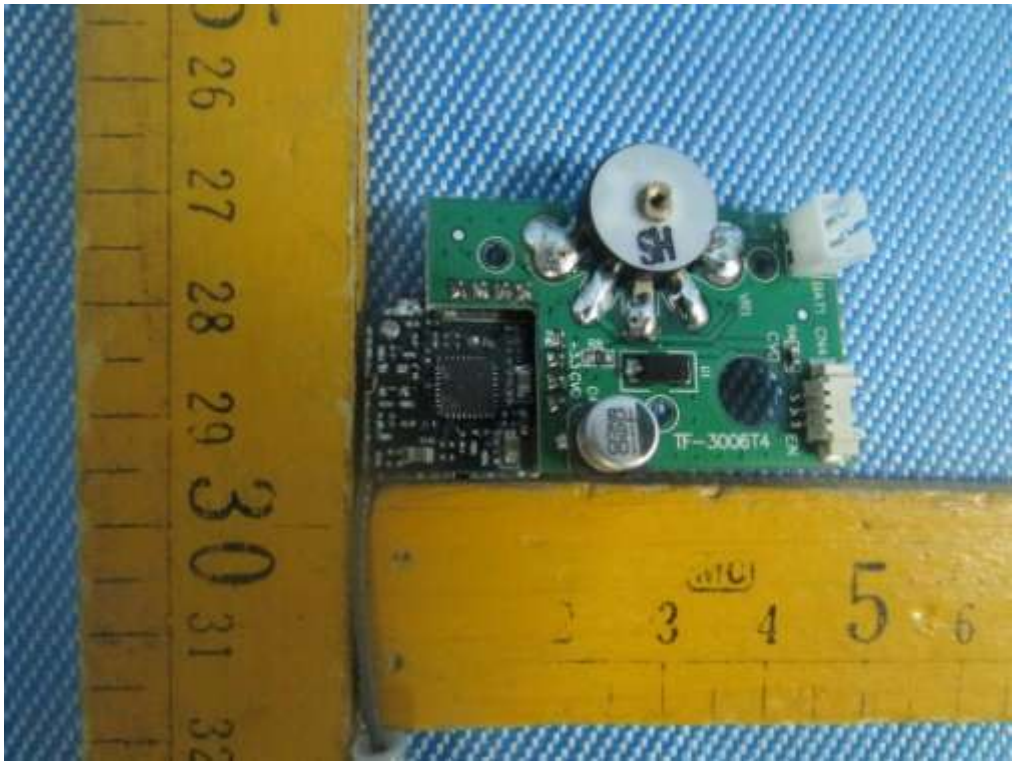
Transmitter

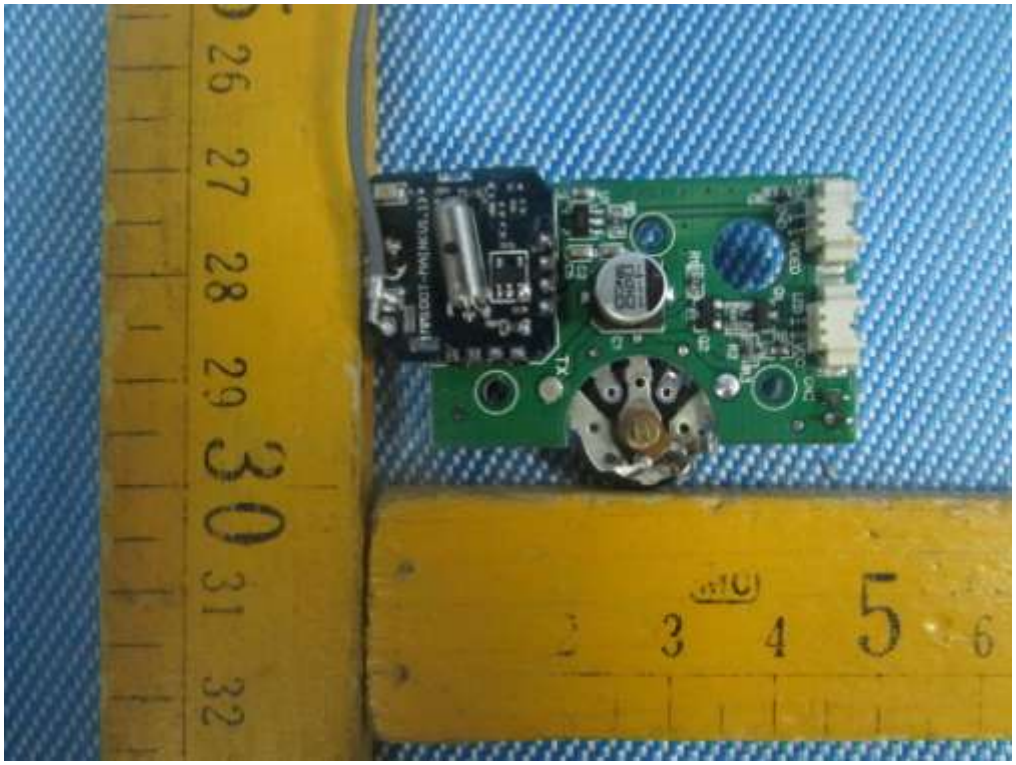
13.2 EUT - Internal View



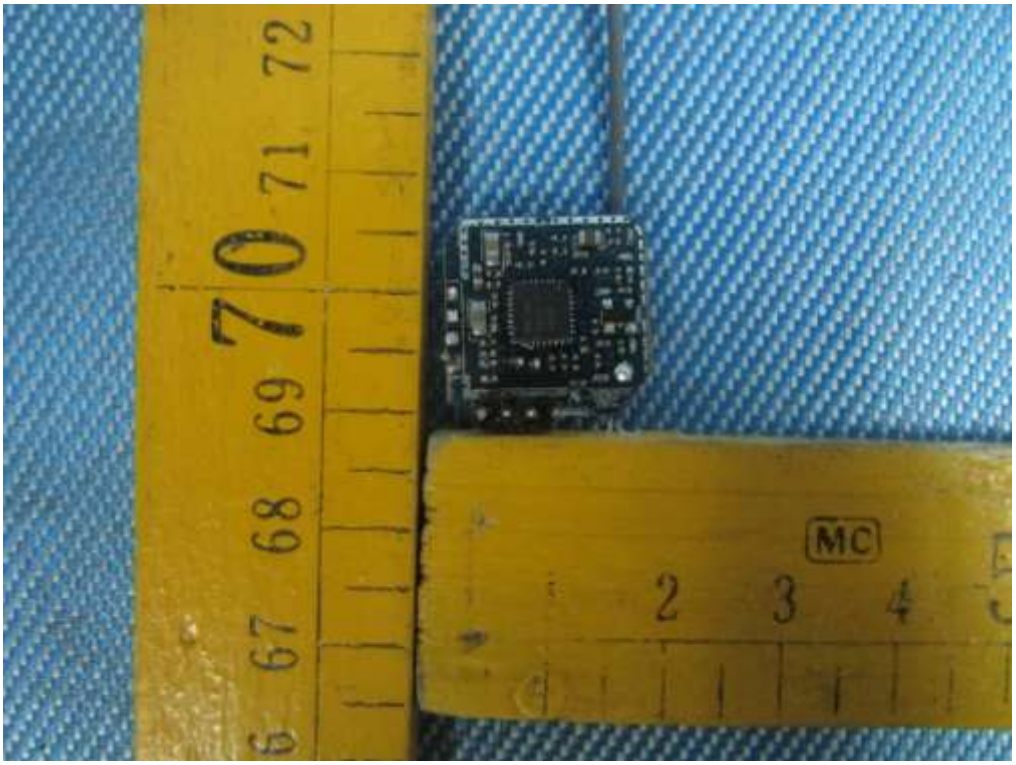


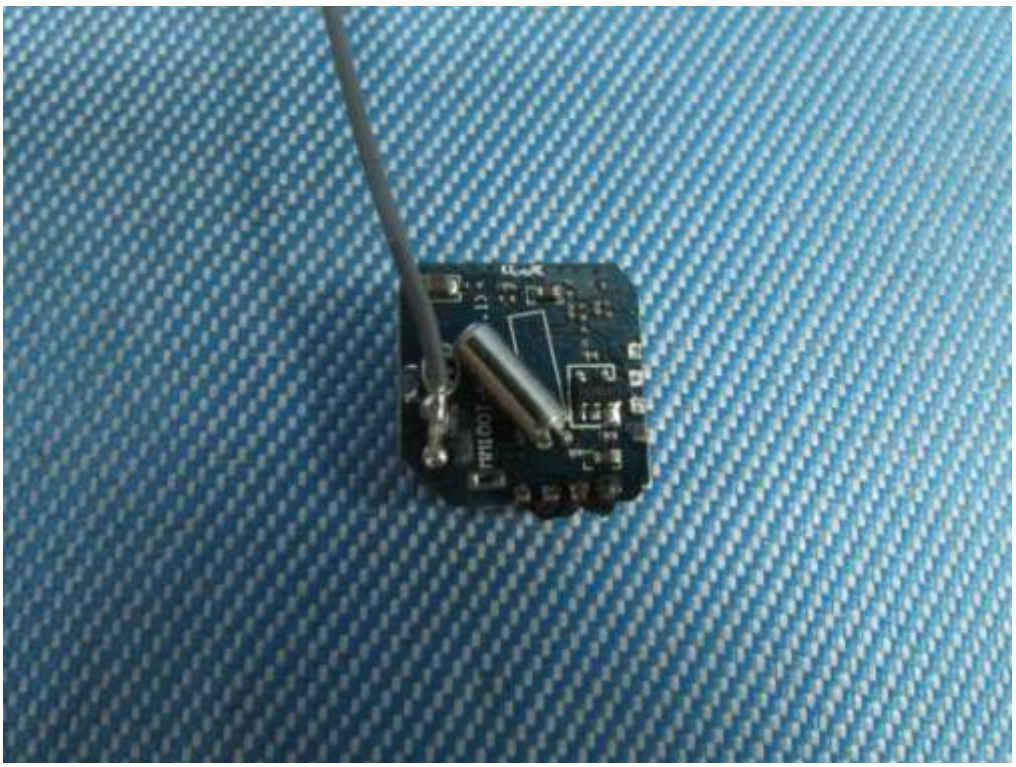



TF-3006T4



13.3 EUT - RF Module View


67 68 69 70 71 72
MC
2 3 4



14 FCC ID Label

14.1 Label sample

Label sample for model: TF3003BMRX

FCC ID: N3ITF3003BMRX
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

14.2 Label Location

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

==END==