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Shenzhen Branch**

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Report No.: SZEM170400292002  
Page: 1 of 27

# TEST REPORT

**Application No.:** SZEM1704002920CR(SGS SZ No.: T51710200214EM)  
**Applicant:** TOY STATE INTERNATIONAL LTD  
**Address of Applicant:** Unit 905, 9/F, West Wing, Tsim Sha Tsui Centre, 66 Mody Road, TST East, Kowloon, Hong Kong

**Equipment Under Test (EUT):**

**EUT Name:** Race Vision 220 FPV PRO, Race Vision 220 FPV, Race Vision FPV Goggles  
**Item No.:** 22608, 22612, 22630 ♣

♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.

**Trade Mark:** NIKKO™ AIR

**Country of Origin:** China

**FCC ID:** V9Q-22608R58

**Standards:** 47 CFR Part 15, Subpart C 15.249

**Date of Receipt:** 2017-04-10

**Date of Test:** 2017-04-21 to 2017-05-22

**Date of Issue:** 2017-06-01

<b>Test Result :</b>	<b>Pass*</b>
----------------------	--------------

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





Jack Zhang  
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. 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. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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<b>Revision Record</b>				
<b>Version</b>	<b>Chapter</b>	<b>Date</b>	<b>Modifier</b>	<b>Remark</b>
01		2017-06-01		Original

<b>Authorized for issue by:</b>				
				
		<hr/> <b>Peter Geng /Project Engineer</b>		
				
		<hr/> <b>Eric Fu /Reviewer</b>		



## 2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.249	N/A	47 CFR Part 15, Subpart C 15.203	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Disturbance at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
20dB Bandwidth	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass
Field Strength of the Fundamental Signal (15.249(a))	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.5&6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass
Radiated Emissions	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass

### Declaration of EUT Family Grouping:

Item No.: K22608, 22612, 22630

Only the item K22608 was tested, since the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above items, with only difference on number.



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## 4 General Information

### 4.1 Details of E.U.T.

Power supply:	Remote: DC 6V by 4*1.5V "AA" batteries plane: DC 7.4V rechargeable battery which charged by USB port monitor: DC 6V by 4*1.5V "AA" batteries (this report is for plane)
Test voltage	AC 120V/60Hz
Cable:	USB charging line: 60cm, unshielded
Modulation type:	FM
Operation frequency:	5732MHz, 5769MHz, 5806MHz, 5843MHz
Antenna type:	Monopole antenna
Antenna gain:	2dBi

### 4.2 Description of Support Units

The EUT was tested as an independently unit

### 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10 <sup>-8</sup>
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	RF Radiated power	4.5dB (below 1GHz)
		4.8dB (above 1GHz)
8	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-18GHz)
9	Temperature test	1 °C
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%



#### **4.4 Test Location**

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.  
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

#### **4.5 Test Facility**

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen 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 No.: 556682.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

#### **4.6 Deviation from Standards**

None

#### **4.7 Abnormalities from Standard Conditions**

None



## 5 Equipment List

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-05-10	2018-05-10
2	EMI Test Receiver	Agilent Technologies	N9038A	SEM004-05	2016-10-09	2017-10-09
3	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2014-11-01	2017-11-01
4	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEM003-11	2015-10-17	2018-10-17
5	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEM003-12	2014-11-24	2017-11-24
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2017-04-14	2018-04-14
7	Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A
8	DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
9	Loop Antenna	Beijing Daze	ZN30401	SEM003-09	2015-05-13	2018-05-13

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2017-05-10	2018-05-10
2	EXA Spectrum Analyzer	Agilent Technologies Inc	N9010A	SEM004-09	2016-07-19	2017-07-19
3	BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2014-11-15	2017-11-15
4	Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2016-10-09	2017-10-09
5	Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
6	Horn Antenna (18-26GHz)	ETS-Lindgren	3160	SEM003-12	2014-11-24	2017-11-24
7	Horn Antenna(26GHz-40GHz)	A.H.Systems, inc.	SAS-573	SEM003-13	2015-02-12	2018-02-12
8	Low Noise Amplifier	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2016-10-09	2017-10-09
9	Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A



<b>Conducted Disturbance at AC Power Line (150kHz-30MHz)</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2017-05-10	2018-05-10
LISN	Rohde & Schwarz	ENV216	SEM007-01	2016-10-09	2017-10-09
LISN	ETS-LINDGREN	3816/2	SEM007-02	2017-04-14	2018-04-14
8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	EMC0120	2016-09-28	2017-09-28
4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	EMC0121	2016-09-28	2017-09-28
2 Line ISN	Fischer Custom	FCC-TLISN-T2-02	EMC0122	2016-09-28	2017-09-28

<b>20dB Bandwidth</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

<b>General used equipment</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2016-10-12	2017-10-12
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2017-04-18	2018-04-18



## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

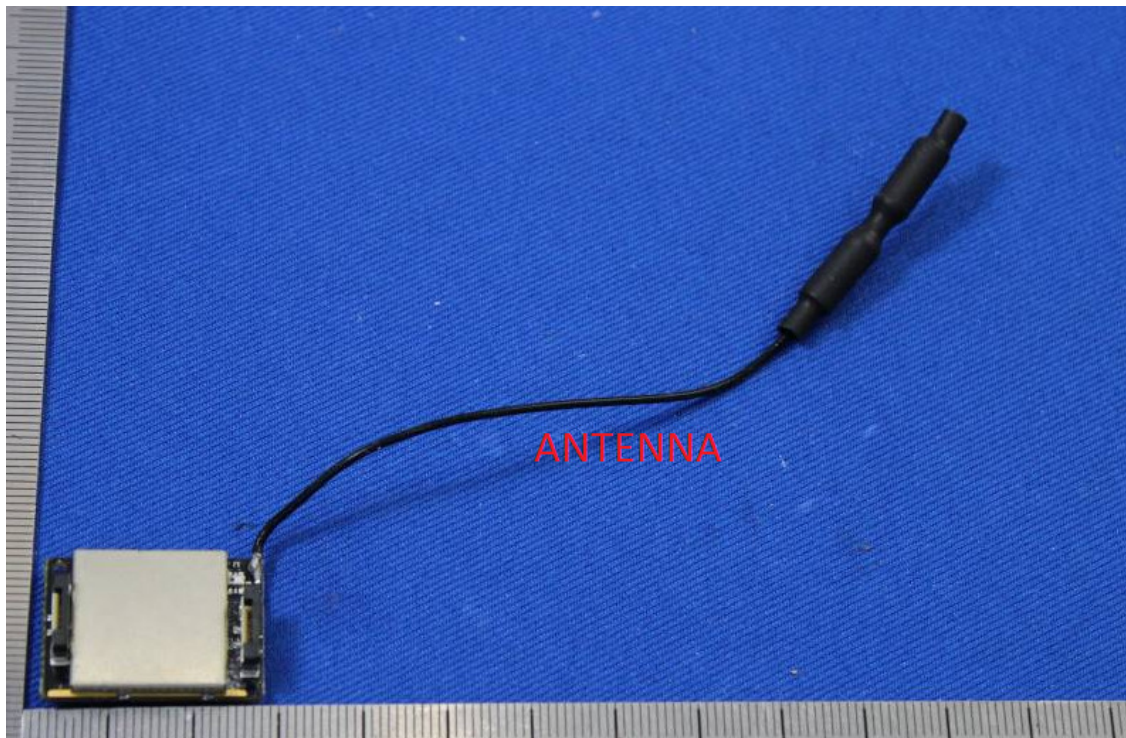
#### 6.1.2 Conclusion

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, 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.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2dBi.



## 7 Radio Spectrum Matter Test Results

### 7.1 Conducted Disturbance at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207  
Test Method: ANSI C63.10 (2013) Section 6.2  
Limit:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

#### 7.1.1 E.U.T. Operation

Operating Environment:

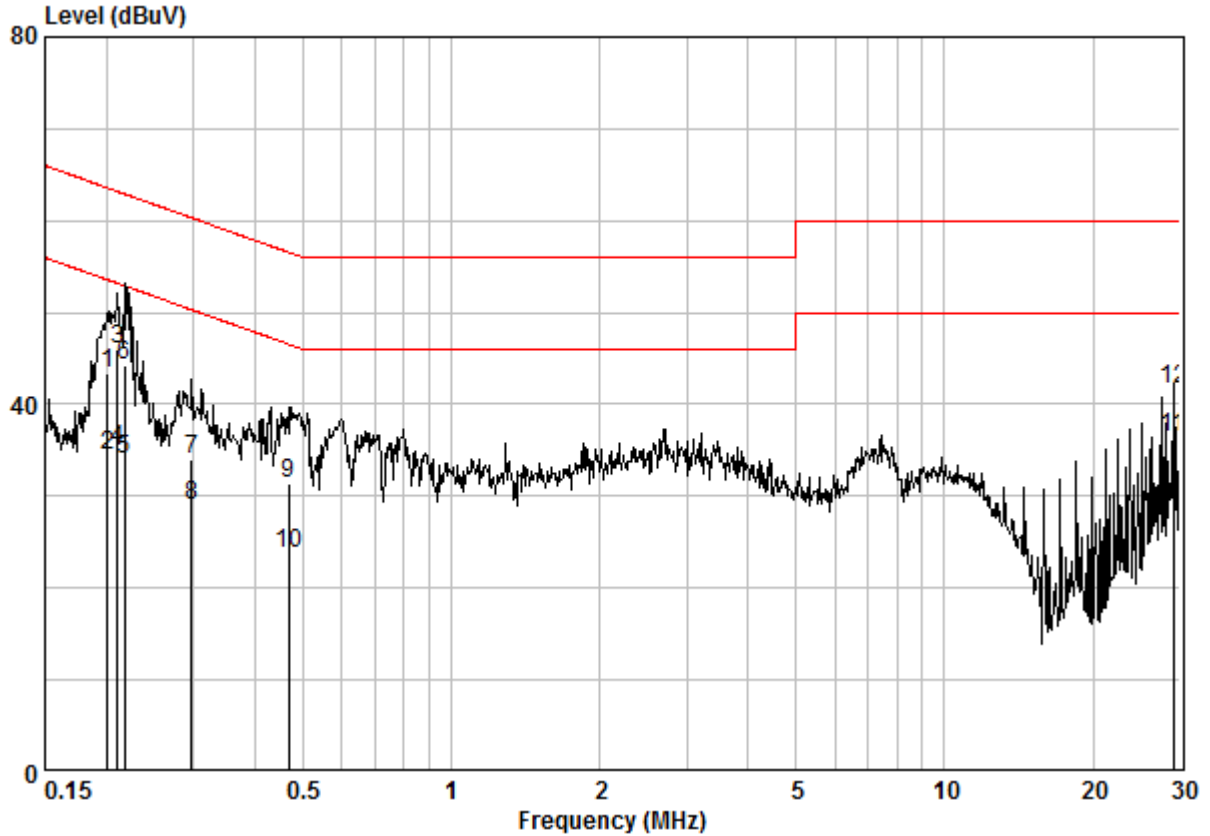
Temperature: 24 °C Humidity: 56 % RH Atmospheric Pressure: 1015 mbar  
Test mode b:TX mode+charging: Keep the EUT transmitted the continuous modulation test signal at the specific channel(s) and keep battery charging (5.8G plane)

#### 7.1.2 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.



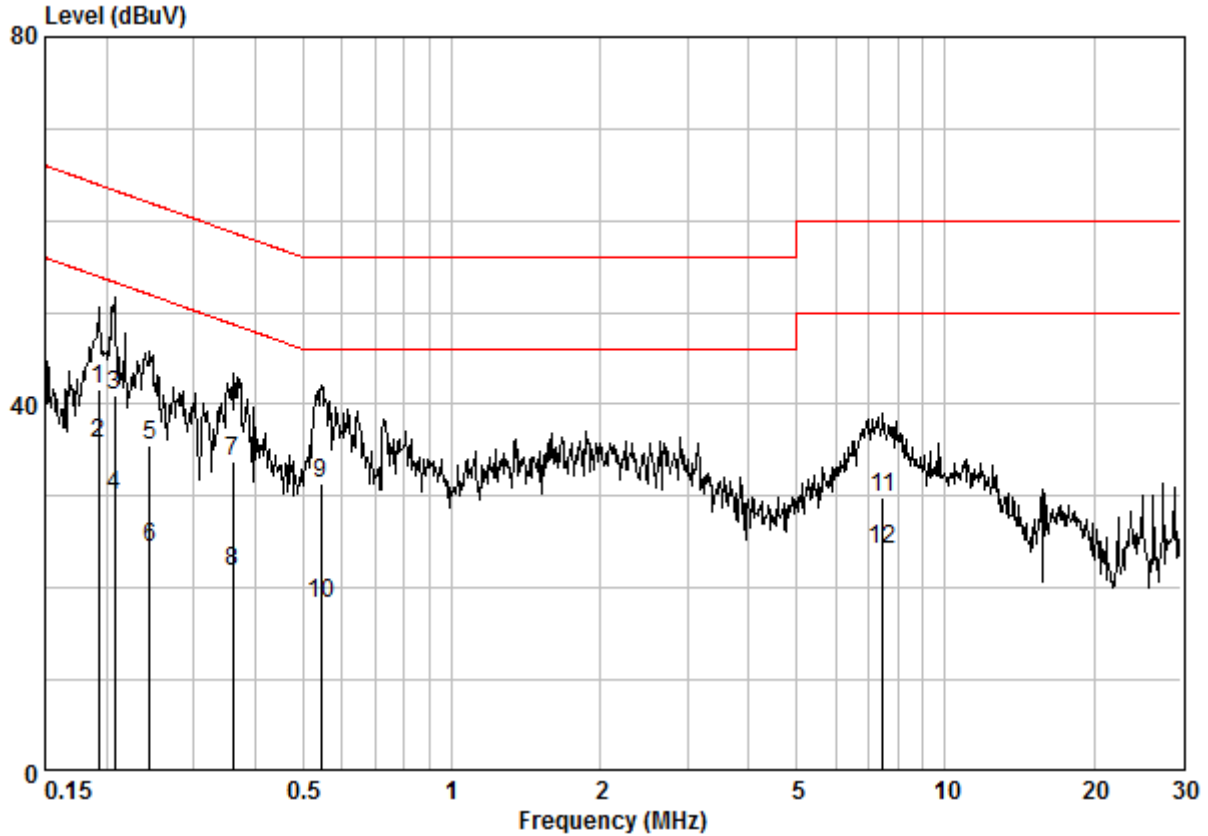
Mode:b; Line:Live Line



Site : Shielding Room  
Condition : CE LINE  
Job No. : 02920CR  
Test Mode : b

	Freq	Cable Loss	LISN Factor	Read Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dB	
1	0.20075	0.02	9.64	33.75	43.41	63.58	-20.17 QP
2	0.20075	0.02	9.64	24.83	34.49	53.58	-19.09 AVERAGE
3	0.21055	0.02	9.64	36.31	45.97	63.18	-17.22 QP
4	0.21055	0.02	9.64	25.34	35.00	53.18	-18.18 AVERAGE
5	0.21735	0.02	9.64	24.24	33.90	52.92	-19.02 AVERAGE
6	0.21735	0.02	9.64	34.67	44.33	62.92	-18.59 QP
7	0.29711	0.02	9.64	24.34	34.00	60.32	-26.33 QP
8	0.29711	0.02	9.64	19.23	28.89	50.32	-21.43 AVERAGE
9	0.46861	0.02	9.64	21.71	31.37	56.54	-25.17 QP
10	0.46861	0.02	9.64	14.02	23.68	46.54	-22.86 AVERAGE
11	29.061	0.15	10.45	25.80	36.40	50.00	-13.60 AVERAGE
12	29.061	0.15	10.45	31.14	41.73	60.00	-18.27 QP

Mode:b; Line:Neutral Line



Site : Shielding Room  
 Condition : CE NEUTRAL  
 Job No. : 02920CR  
 Test Mode : b

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dB	
1	0.19242	0.02	9.63	31.89	41.54	63.93	-22.39 QP
2	0.19242	0.02	9.63	26.16	35.81	53.93	-18.12 AVERAGE
3	0.20723	0.02	9.63	31.39	41.04	63.32	-22.27 QP
4	0.20723	0.02	9.63	20.38	30.03	53.32	-23.29 AVERAGE
5	0.24422	0.02	9.63	25.86	35.51	61.95	-26.44 QP
6	0.24422	0.02	9.63	14.76	24.41	51.95	-27.54 AVERAGE
7	0.35955	0.02	9.63	24.09	33.74	58.74	-25.00 QP
8	0.35955	0.02	9.63	12.15	21.80	48.74	-26.94 AVERAGE
9	0.54355	0.02	9.63	21.82	31.47	56.00	-24.53 QP
10	0.54355	0.02	9.63	8.59	18.24	46.00	-27.76 AVERAGE
11	7.486	0.09	9.78	20.01	29.88	60.00	-30.12 QP
12	7.486	0.09	9.78	14.25	24.12	50.00	-25.88 AVERAGE



## 7.2 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215  
Test Method: ANSI C63.10 (2013) Section 6.9  
Limit: N/A

### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 56 % RH Atmospheric Pressure: 1015 mbar  
Test mode b:TX mode+charging: Keep the EUT transmitted the continuous modulation test signal at the specific channel(s) and keep battery charging (5.8G plane)  
c:TX mode\_Keep the EUT transmitted the continuous modulation test signal at the specific channel(s) (5.8G plane)

The worst case: c:TX mode\_Keep the EUT transmitted the continuous modulation test signal at the specific channel(s) (5.8G plane)

### 7.2.2 Measurement Procedure and Data

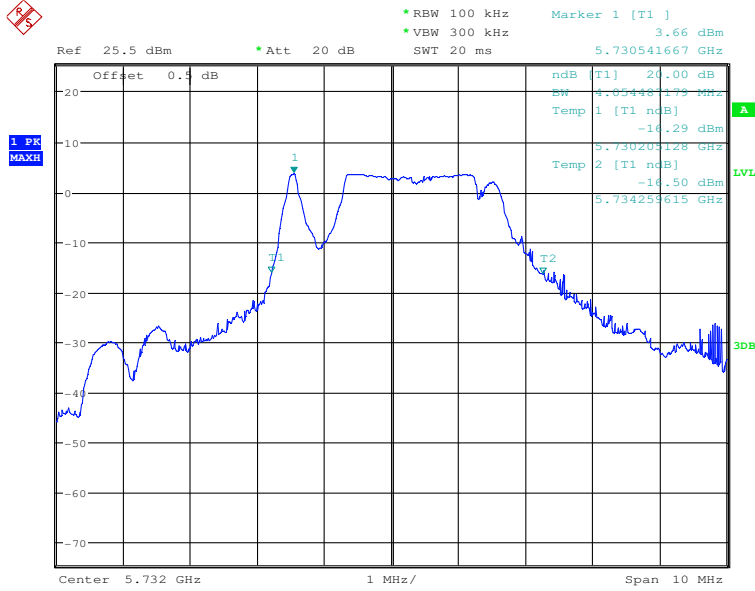
#### Measurement Data

Test Channel	20dB bandwidth (MHz)	Results
5732	4.05	Pass
5806	4.47	Pass
5843	4.50	Pass

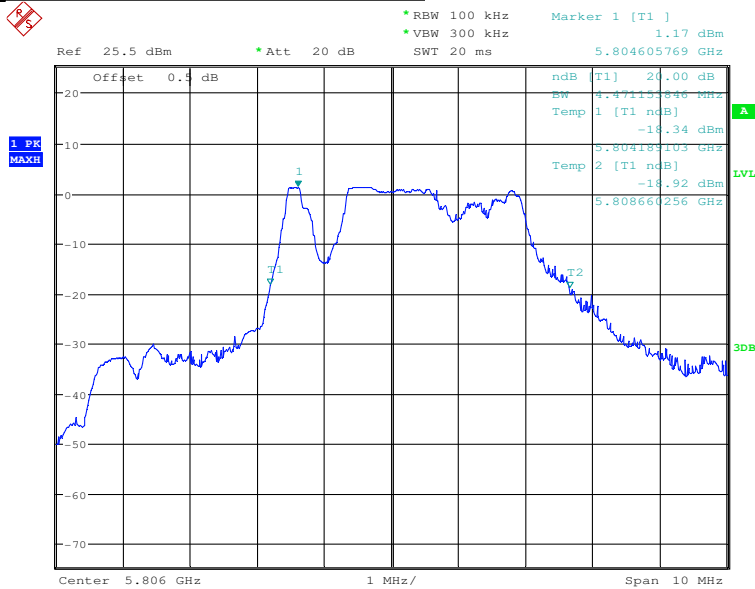


Test plot as follows:

Test channel:	5732
---------------	------

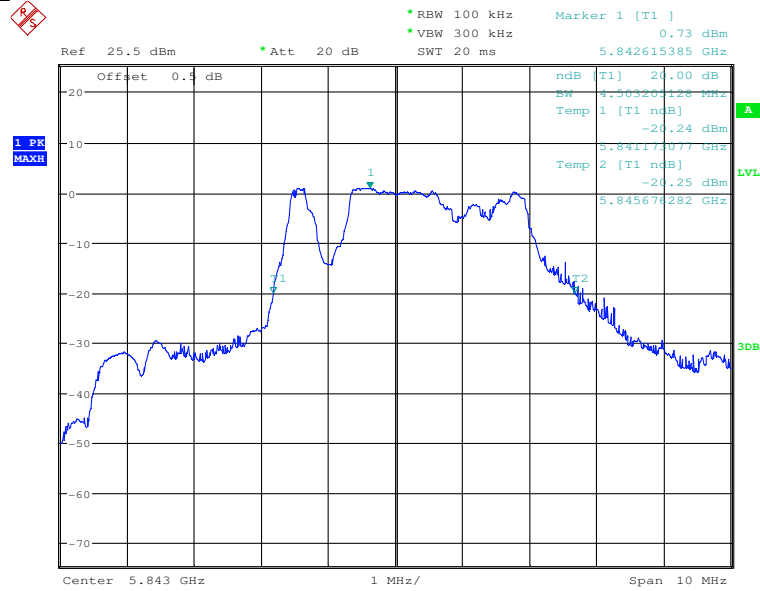


Test channel:	5806
---------------	------





Test channel: 5843





### 7.3 Field Strength of the Fundamental Signal (15.249(a))

Test Requirement 47 CFR Part 15, Subpart C 15.249(a)  
Test Method: ANSI C63.10 (2013) Section 6.5&6.6  
Measurement Distance: 3m  
Limit:

Frequency	Limit (dBuV/m @3m)	Remark
5725MHz-5875MHz	94.0	Average Value
	114.0	Peak Value





### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1015 mbar

Test mode b:TX mode+charging: Keep the EUT transmitted the continuous modulation test signal at the specific channel(s) and keep battery charging (5.8G plane)  
c:TX mode\_Keep the EUT transmitted the continuous modulation test signal at the specific channel(s) (5.8G plane)

The worst case: c:TX mode\_Keep the EUT transmitted the continuous modulation test signal at the specific channel(s) (5.8G plane)

### 7.3.2 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. 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.
- e. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. 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.
- h. Test the EUT in the lowest channel,the middle channel,the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.



**SGS-CSTC Standards Technical Services Co., Ltd.**  
**Shenzhen Branch**

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Mode:b; Polarization:Horizontal; Modulation Type:FM; Channel:Low; Detector: peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
5732.754	34.54	8.49	38.35	98.61	103.29	114	-10.71

Mode:b; Polarization:Horizontal; Modulation Type:FM; Channel:Low; Detector: average

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
5732.754	34.54	8.49	38.35	79.48	84.16	94	-9.84

Mode:b; Polarization:Vertical; Modulation Type:FM; Channel:Low; Detector: peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
5732.754	34.54	8.49	38.35	96.46	101.14	114	-12.86

Mode:b; Polarization:Vertical; Modulation Type:FM; Channel:Low; Detector: average

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
5732.754	34.54	8.49	38.35	79.19	83.87	94	-10.13

Mode:b; Polarization:Horizontal; Modulation Type:FM; Channel:middle; Detector: peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
5806.196	34.59	8.56	38.34	95.83	100.64	114	-13.36

Mode:b; Polarization:Horizontal; Modulation Type:FM; Channel:middle; Detector: average

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
5806.196	34.59	8.56	38.34	78.01	82.69	94	-11.31



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Mode:b; Polarization:Vertical; Modulation Type:FM; Channel:middle; Detector: peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
5806.847	34.59	8.56	38.34	93.64	98.45	114	-15.55

Mode:b; Polarization:Vertical; Modulation Type:FM; Channel:middle; Detector: average

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
5806.847	34.59	8.56	38.34	77.06	81.74	94	-12.26

Mode:b; Polarization:Horizontal; Modulation Type:FM; Channel:High; Detector: peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
5840.847	34.61	8.6	38.33	95.66	100.54	114	-13.46

Mode:b; Polarization:Horizontal; Modulation Type:FM; Channel:High; Detector: average

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
5840.847	34.61	8.6	38.33	78.35	83.03	94	-10.97

Mode:b; Polarization:Vertical; Modulation Type:FM; Channel:High; Detector: peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
5843.869	34.61	8.6	38.33	93.06	97.94	114	-16.06

Mode:b; Polarization:Vertical; Modulation Type:FM; Channel:High; Detector: average

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
5843.869	34.61	8.6	38.33	76.75	81.43	94	-12.57



**7.4 Radiated Emissions**

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)  
Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6  
Measurement Distance: 3m  
Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Limit (dBuV/m)	Detector	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	-	300
0.490-1.705	24000/F(kHz)	-	-	30
1.705-30	30	-	-	30
30-88	100	40.0	QP	3
88-216	150	43.5	QP	3
216-960	200	46.0	QP	3
960-1000	500	54.0	QP	3
Above 1000	500	54.0	AV	3

**7.4.1 E.U.T. Operation**

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1015 mbar

Test mode b:TX mode+charging: Keep the EUT transmitted the continuous modulation test signal at the specific channel(s) and keep battery charging (5.8G plane)  
c:TX mode\_Keep the EUT transmitted the continuous modulation test signal at the specific channel(s) (5.8G plane)

The worst case: c:TX mode\_Keep the EUT transmitted the continuous modulation test signal at the specific channel(s) (5.8G plane)

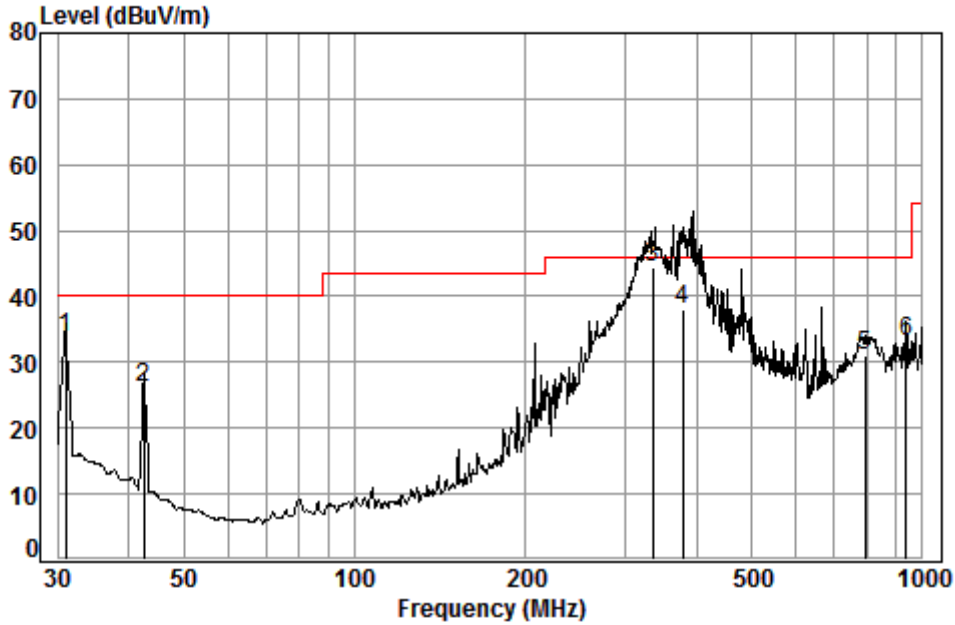
**7.4.2 Measurement Procedure and Data**

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.



**Below 1G:**

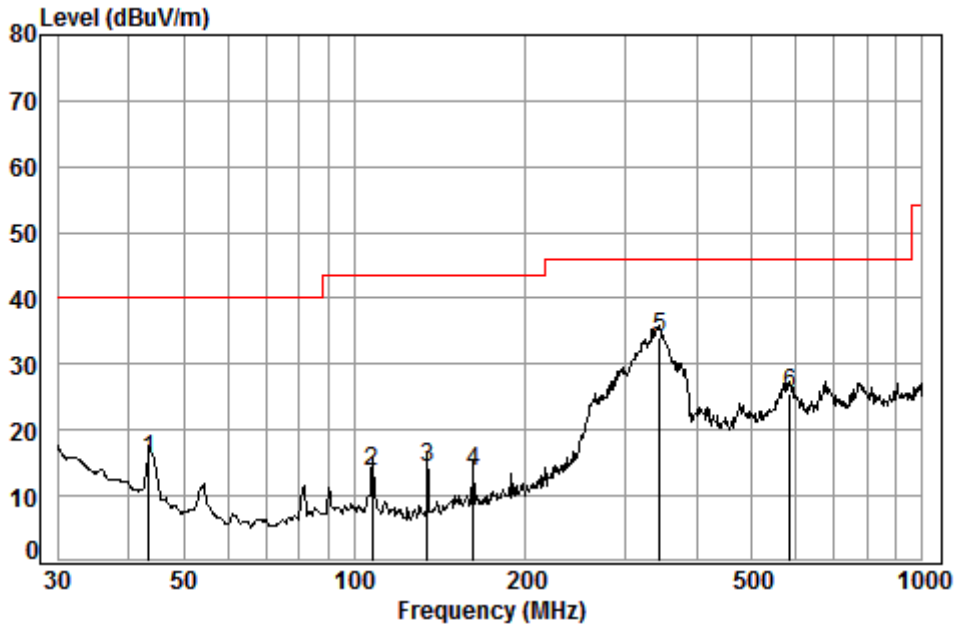
Mode:c; Polarization:Horizontal



Condition: 3m HORIZONTAL  
Job No. : 2920CR  
Test mode: c

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.96	0.60	18.16	27.35	42.33	33.74	40.00	-6.26
2	42.60	0.66	11.96	27.31	40.87	26.18	40.00	-13.82
3 pp	334.86	2.01	14.45	26.68	54.52	44.30	46.00	-1.70
4	378.58	2.14	16.04	26.99	46.74	37.93	46.00	-8.07
5	793.40	3.18	22.07	27.31	33.08	31.02	46.00	-14.98
6	935.55	3.64	23.30	26.61	32.79	33.12	46.00	-12.88

Mode:b; Polarization:Vertical



Condition: 3m VERTICAL  
Job No. : 2920CR  
Test mode: c

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	43.51	0.68	11.56	27.31	30.67	15.60	40.00	-24.40
2	107.51	1.22	8.72	27.15	30.95	13.74	43.50	-29.76
3	134.56	1.29	7.88	26.98	32.24	14.43	43.50	-29.07
4	162.04	1.34	9.58	26.85	29.58	13.65	43.50	-29.85
5 pp	344.39	2.04	14.10	26.75	44.55	33.94	46.00	-12.06
6	584.79	2.69	19.37	27.57	30.95	25.44	46.00	-20.56



**Above 1G:**

Mode:c; Polarization:Horizontal; Modulation Type:FM; Channel:Low; Detector: Peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
7840.053	36.51	9.98	36.54	42.82	53.35	74.00	-20.65
9443.290	37.40	10.92	35.18	38.67	52.35	74.00	-21.65
11464.000	38.07	12.33	35.49	38.20	53.80	74.00	-20.20
13254.890	38.70	13.75	38.25	37.40	52.56	74.00	-21.44
15185.920	41.34	15.00	38.70	34.90	53.37	74.00	-20.63
17196.000	43.04	17.50	36.20	28.80	53.89	74.00	-20.11

Mode:c; Polarization:Vertical; Modulation Type:FM; Channel:Low; Detector: Peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
7613.837	36.37	9.89	36.75	42.61	52.68	74.00	-21.32
9578.025	37.52	11.03	35.11	38.89	52.90	74.00	-21.10
11464.000	38.07	12.33	35.49	44.13	59.73	74.00	-14.27
13610.090	38.73	14.22	38.61	37.92	53.09	74.00	-20.91
15446.290	41.39	15.21	38.41	34.78	53.90	74.00	-20.10
17196.000	43.04	17.50	36.20	28.17	53.26	74.00	-20.74

Mode:c; Polarization:Vertical; Modulation Type:FM; Channel:Low; Detector: Average:

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
11464.000	38.07	12.33	35.49	34.50	50.10	54.00	-3.90



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Mode:c; Polarization:Horizontal; Modulation Type:FM; Channel:middle; Detector: Peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
7795.750	36.48	9.96	36.58	43.12	53.56	74.00	-20.44
9452.214	37.42	10.92	35.17	38.92	52.63	74.00	-21.37
11612.000	38.21	12.35	35.52	37.83	53.61	74.00	-20.39
13292.500	38.68	13.80	38.29	37.59	52.72	74.00	-21.28
15651.890	41.34	15.37	38.18	33.71	53.25	74.00	-20.75
17418.000	43.30	18.09	36.09	27.79	53.79	74.00	-20.21

Mode:c; Polarization:Vertical; Modulation Type:FM; Channel:middle; Detector: Peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
7464.314	36.31	9.83	36.88	42.69	52.50	74.00	-21.50
9266.588	37.09	10.83	35.27	40.43	53.59	74.00	-20.41
11612.000	38.21	12.35	35.52	44.00	59.78	74.00	-14.22
14027.700	39.27	14.60	39.00	37.40	52.94	74.00	-21.06
15920.250	41.23	15.58	37.89	33.36	53.36	74.00	-20.64
17418.000	43.30	18.09	36.09	27.02	53.02	74.00	-20.98

Mode:c; Polarization:Vertical; Modulation Type:FM; Channel:middle; Detector:Average:

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
11612.000	38.21	12.35	35.52	34.11	49.89	54.00	-4.11





Mode:c; Polarization:Horizontal; Modulation Type:FM; Channel:High; Detector: Peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
7592.294	36.36	9.89	36.77	42.17	52.21	74.00	-21.79
9632.455	37.53	11.08	35.08	38.65	52.76	74.00	-21.24
11686.000	38.29	12.36	35.54	37.51	53.38	74.00	-20.62
13713.310	38.86	14.32	38.71	37.68	52.94	74.00	-21.06
15460.890	41.39	15.22	38.39	34.43	53.58	74.00	-20.42
17529.000	43.45	18.39	36.04	26.38	53.01	74.00	-20.99

Mode:c; Polarization:Vertical; Modulation Type:FM; Channel:High; Detector: Peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
7832.651	36.50	9.98	36.55	42.40	52.91	74.00	-21.09
9257.840	37.07	10.82	35.27	39.98	53.11	74.00	-20.89
11686.000	38.29	12.36	35.54	44.74	60.61	74.00	-13.39
13830.370	39.00	14.43	38.83	37.99	53.34	74.00	-20.66
16177.920	41.74	15.78	37.53	32.13	53.13	74.00	-20.87
17529.000	43.45	18.39	36.04	27.19	53.82	74.00	-20.18

Mode:c; Polarization:Vertical; Modulation Type:FM; Channel:High; Detector: Average

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
11686.000	38.29	12.36	35.54	35.04	50.91	54.00	-3.09

Remark:

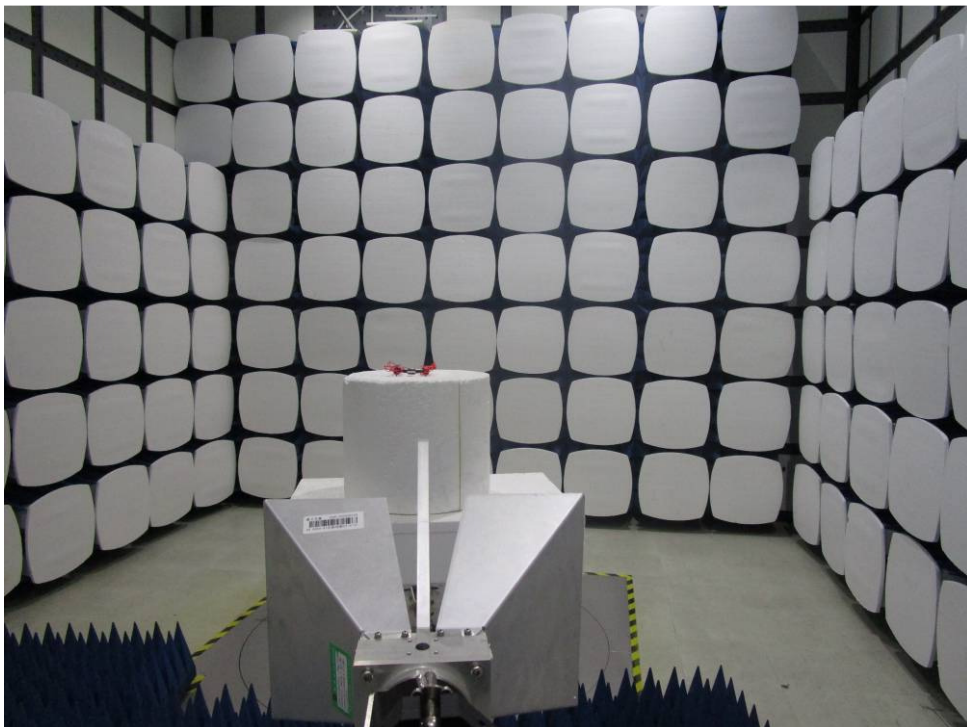
- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Pre-amplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Pre-amplifier Factor
- 2) Scan from 9kHz to 25GHz, The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported .
- 3) Tests were conducted in H/L/M channel and the worst case(Low channel) is reported for frequency band 30MHz to 1GHz

## 8 Photographs

### 8.1 Conducted Disturbance at AC Power Line (150kHz-30MHz) Test Setup



## 8.2 Radiated Emissions Test Setup



## 8.3 EUT Constructional Details

Refer to Appendix B - Photographs of EUT Constructional Details for SZEM1704002920CR.