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FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

Report No.: GLEMO050601748RFF(I)
Page: 1 of 20
FCC ID: TIVDYNAM-CN001

FCC TEST REPORT

Application No. : GLEMO050601748RF
Applicant: Shenzhen Dynam Industrial & Trading Co., Ltd
FCC ID: TIVDYNAM-CN001
Fundamental Carrier Frequency : 72.030MHz, 72.070MHz, 72.110MHz, 72.150MHz, 72.190MHz,
72.230MHz, 72.770MHz, 72.810MHz, 72.850MHz, 72.890MHz. ♣
♣ Please refer to section 2 of this report which indicates which Fundamental Carrier Frequency was actually tested.

Equipment Under Test (EUT):

Name: Remote Control
Model: DYNAM-V6
Standards: FCC Part 95: 2002
Date of Receipt: 20 June 2005
Date of Test: 22 June to 20 July 2005
Date of Issue: 28 July 2005

Test Result :	PASS *
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Kent Hsu
Laboratory Manager

This report refers to the General Conditions for Inspection and Testing Services, printed overleaf
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. 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. 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.



2 Test Summary

Test	Test Requirement	Stanadard Paragraph	Result
Flied Strength of Fundamental	FCC Part 95: 2002	Section 95.639	PASS
Flied Strength of Harmornics or other Frequency	FCC Part 95: 2002	Section 95.635	PASS
Emission Bandwidth	FCC Part 95: 2002	Section 95.633	PASS
Frequency Stability	FCC Part 95: 2002	Section 95.623	PASS
Crystal Access Restrictions	FCC Part 95: 2002	Section 95.645	PASS

Remark: The fundamental frequencies:

72.030MHz, 72.070MHz, 72.110MHz, 72.150MHz, 72.190MHz,

72.230MHz, 72.770MHz, 72.810MHz, 72.850MHz, 72.890MHz.

Since the same PCBs only use 10 types of crystals,

only 72.150MHz product was completely tested in the whole report.



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4 General Information

4.1 Client Information

Applicant Name: Shenzhen Dynam Industrial & Trading Co., Ltd
Applicant Address: Room 19B/2, City Building, Fuhua Road, Futian District, Shenzhen 518035, China.

4.2 General Description of E.U.T.

Product Name: Remote Control
Model: DYNAM-V6
Power Supply: 9.6V DC (8 x 'AA' Size Rechargeable Batteries).
Power Cord: N/A-

4.3 Description of Support Units

The EUT was tested as an independent unit: a 72MHz Remote Control.

4.4 Standards Applicable for Testing

The customer requested FCC tests for a 72MHz Remote Control.
The standard used was FCC PART 95.

4.5 Test Location

All tests were performed at:-

SGS-CSTC Standards Technical Services Ltd., Guangzhou Safety & EMC Laboratory, 1/F, Building No. 1, Agriculture Machinery Materials Company Warehouse Ltd., Wushan Road Shipai, Tianhe District, Guangzhou, China. P.C. 510630.

Tel: +86 20 3848 1001

Fax: +86 20 3848 1006

4.6 Other Information Requested by the Customer

None.



4.7 Test Facility

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

- **NVLAP – Lab Code: 200611-0**
SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0. Effective through December 31, 2004.
- **ACA**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.
- **VCCI**
The 3m Semi-anechoic chamber and Shielded Room (11.5m x 4m x 4m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1599 and C-1706 respectively.
Date of Registration: June 01, 2005. Valid until February 22, 2008
- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**
Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.
- **CNAL – LAB Code: L0141**
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAL/AC01: 2002 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of Testing Laboratories.
- **FCC – Registration No.: 282399**
SGS-CSTC Standards Technical Services 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 282399, May 31, 2002. With the above and NVLAP's accreditation, SGS-CSTC is an authorised test laboratory for the DoC process.
- **Industry Canada (IC)**
The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5169.

5 Test Results

5.1 Test Instruments

Test Equipment	Manufacturer	Model	Asset No.	Cal. Due Date
3m Semi- Anechoic Chamber	Frankonia	3m method	EMC0501	15-02-2005
EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	20-09-2005
Bilog Type Antenna	Schaffner Chase	CBL6143	EMC0519	17-01-2005
Coaxial cable	SGS-CSTC	10m	EMC0514	04-11-2004
Spectrum Analyzer	Rohde & Schwarz	FSP 30	EMC0521	01-04-2005
Horn Antenna	Rohde & Schwarz	HF906	EMC0517	01-04-2005
Temperature, Humidity & Barometer	Oregon Scientific	BA-888	EMC0003	30-06-2005
Peramplifier	Agilent	8449B	EMC0520	30-06-2005
Coaxial cable	SGS	N/A	EMC0514	01-06-2005
Shielding Room	Frankonia	12 x 4 x 4 m ³	EMC0103	N/A
LISN	Schaffner Chase	MNZ050D11	1421	04-11-2005
Coaxial Cable	SGS	2m	EMC0107	01-06-2005
Temperature Chamber	TERCHY	MHG-800RR	0118	31-01-2006

5.2 E.U.T. Operation

Input voltage: 9.6V DC (8 x 'AA' Size Rechargeable Batteries).

Operating Environment:

Temperature: 24.0 °C

Humidity: 56 % RH

Atmospheric Pressure: 1012 mbar

EUT Operation: Test in transmitting mode:



5.3 Test Procedure & Measurement Data

5.3.1 Field Strength of Fundamental

Test Requirement:	FCC Part 95 Section 95.639
Test Method:	Based on ANSI C 63.4.
Test Date:	22 June 2005
Measurement Distance:	3m (Semi-Anechoic Chamber)
	Test instrumentation resolution bandwidth 120 kHz (30 MHz - 1000 MHz)
Operation:	Receive antenna scan height 1 - 4 m, polarization Vertical/ Horizontal

Requirements:

The maximum transmitter power for an R/C transmitter, under any condition of modulation, should not exceed a carrier power or peak envelop TP of:
For 72-76 MHz operation: the limit is 0.75 W.

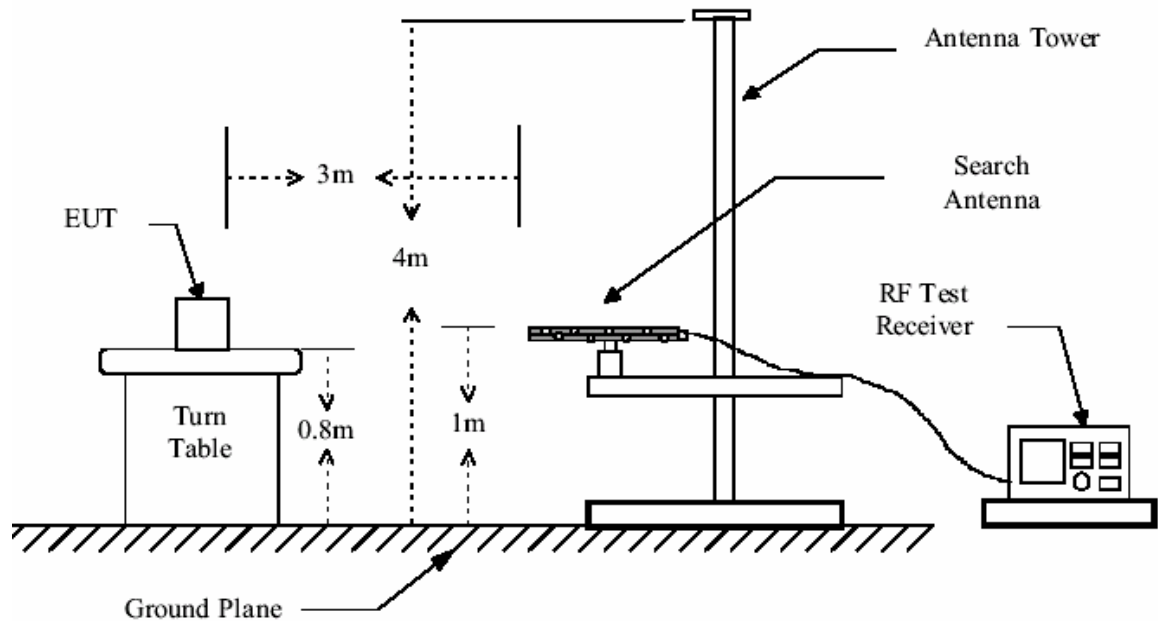
Test Procedure:

Test Method: The procedure used was ANSI Standard C63.4-2003.

The technique used to find the output power of the transmitter was the antenna substitution method. The following test procedure was followed:

1. The EUT was powered ON and placed on a table in the chamber. The antenna of the transmitter was extended to its maximum length.
2. The fundamental frequency (72.150MHz) of the transmitter was maximized on the test Receiver display by raising and lowering the receive antenna and by rotating the turntable. After the fundamental emission was maximized, a field strength measurement was made.
3. Steps 1 and 2 were performed with the EUT and the receive antenna in both vertical and horizontal polarization and performed a pre-test three orthogonal planes.
4. The transmitter was then removed and replaced with a substitution antenna.
5. A signal at the fundamental frequency (72.150MHz) was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally and vertically polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test Receiver. The level of the signal generator was adjusted until the measured field strength level in step 2 is obtained for this set of conditions.
6. The output power into the substitution antenna was then measured.

Test Configuration:



Test result:

The highest field strength measured at the fundamental frequency (72.150MHz) was 101.8dB μ V/m at a distance of 3 meters.

The transmitter output power found using the antenna substitution method was 0.25mW.

The unit does meet the FCC requirements.



5.3.2 Field Strength of Harmonics or other Frequency

Test Requirement:	FCC Part 95 Section 95.635
Test Method:	Based on ANSI C 63.4.
Test Date:	22 June 2005
Measurement Distance:	3m (Semi-Anechoic Chamber)
Frequency range	30 MHz – 1GHz for transmitting mode. Test instrumentation resolution bandwidth 120 kHz (30 MHz - 1000 MHz)
Operation:	Receive antenna scan height 1 - 4 m, polarization Vertical/ Horizontal

Requirements:

The power of each unwanted emission should be less than the transmitter power (TP) by at least $56 + 10\log(TP)$ on any frequency removed from the center of the authorized bandwidth by more than 250%.

The transmitter complied with the radiated spurious requirement and the following table contains the 10 highest spurious emissions.

Tuned Frequency: 72.015 MHz

Measurement Distance: 3m

Calculation of FCC Limit: $FS - [43 + 10\log(TP)]$

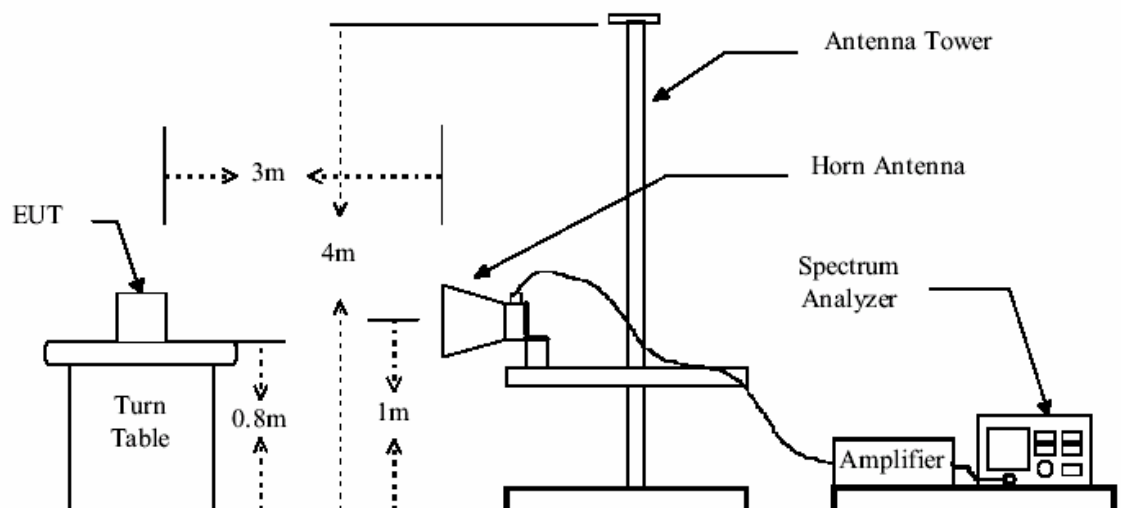
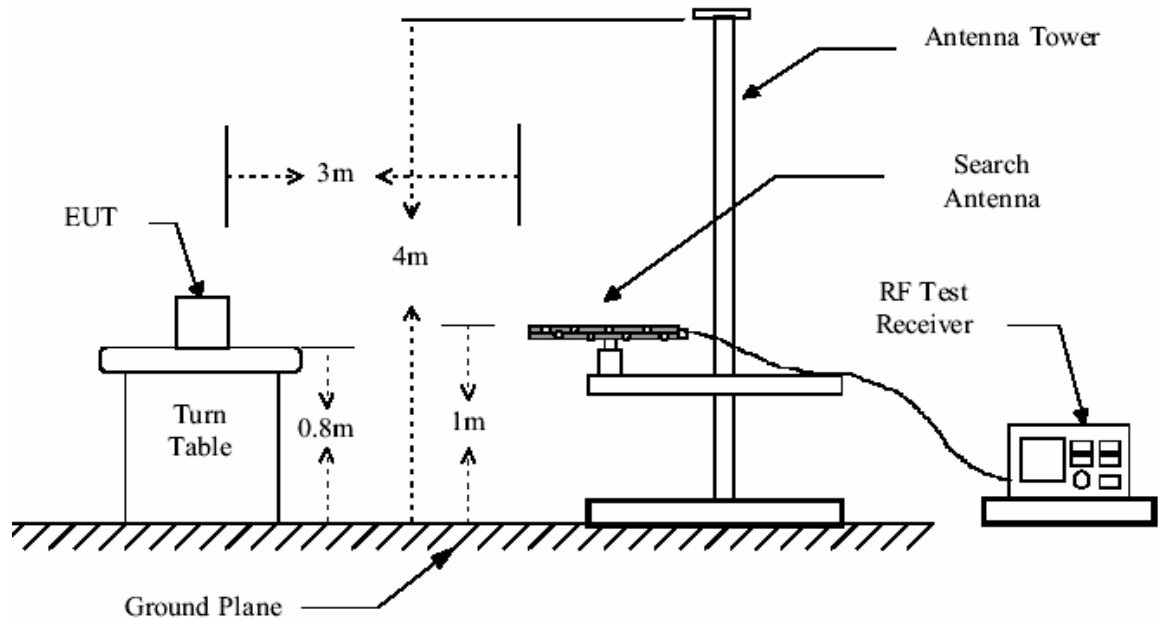
Where, TP = measured transmitter power (W); FS = Fundamental field strength (dBuV/m)

$$101.8 \text{ dBuV/m} - [56 + 10\log(2.5\text{mW}/1000)] = 81.8\text{dBuV/m}$$

The field strength of the spurious emissions should not exceed 81.8dBuV/m

Test Procedure: The procedure used was ANSI Standard C63.4-2003. The receiver was scanned from 30MHz to 1GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. 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. The worst case emissions were reported.

Test Configuration:





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The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier .
The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Peramlifer Factor

The following test results were performed on the EUT:

Quasi-Peak Measurement

Vertical:

Frequency	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Antenna High	Turntable Angle
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(°)
54.130	61.8	81.8	-20.0	74.8	11.8	0.4	25.2	100	356
144.30	67.9	81.8	-13.9	79.1	12.8	1.0	25.0	137	29
216.45	60.0	81.8	-21.8	71.8	11.4	1.4	24.5	156	46
288.60	50.3	81.8	-31.5	59.0	14.1	1.7	24.4	137	104
360.75	45.7	81.8	-36.1	52.5	16.0	2.0	24.8	147	246
432.90	37.1	81.8	-44.7	43.7	16.5	2.2	25.3	146	233
505.05	41.0	81.8	-40.8	48.6	15.8	2.4	25.9	165	78
613.28	65.3	81.8	-16.5	68.7	19.7	2.7	25.8	178	124

Horizontal:

Frequency	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Antenna High	Turntable Angle
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(°)
54.120	39.5	81.8	-42.3	52.0	12.3	0.4	25.2	112	264
144.300	45.7	81.8	-36.2	56.5	13.2	1.0	25.0	134	283
216.450	44.8	81.8	-37.0	54.8	13.2	1.4	24.5	107	13
288.600	45.7	81.8	-36.1	51.2	17.2	1.7	24.4	154	56
360.750	44.0	81.8	-37.8	49.9	17.0	2.0	24.8	164	81
432.900	44.3	81.8	-37.5	51.0	16.5	2.2	25.3	198	277
505.050	44.9	81.8	-36.9	52.1	16.4	2.4	25.9	145	356
613.500	45.8	81.8	-36.0	49.9	19.0	2.7	25.8	144	133

1. Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.
2. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

The unit does meet the FCC requirements.

5.3.3 Emission Bandwidth

Test Requirement: FCC Part 95 Section 95.633

Test Method: Based on ANSI C 63.4.

Test Date: 21 June 2005

Requirements: An R/C transmitter is allowed to transmit any appropriate non-voice emission, which meets the emission limitations for an R/C transmitter. The authorized bandwidth for any emission type transmitted by an R/C transmitter is 8kHz.

The power of each unwanted emission shall be less than the transmitter power (TP) by:

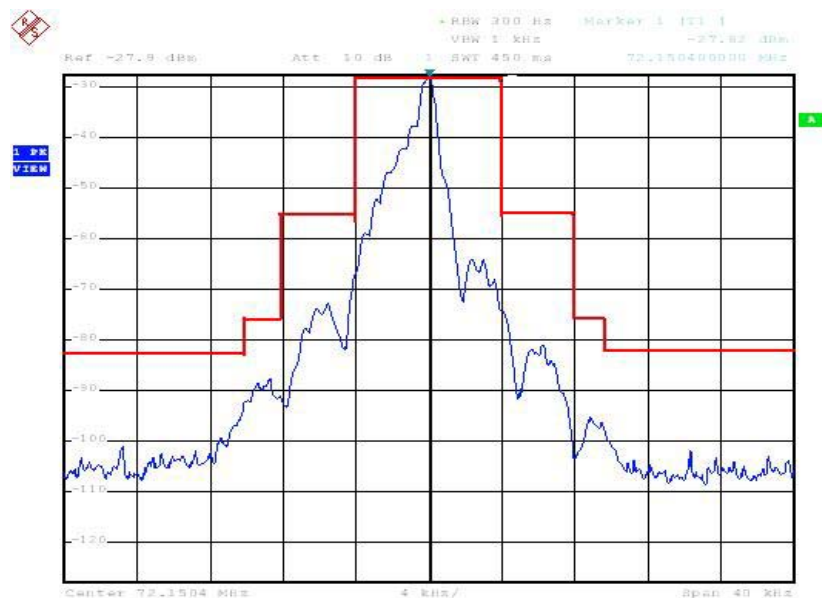
(1) At least 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

(2) At least 45 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 125% of the authorized bandwidth.

(3) At least 55 dB on any frequency removed from the center of the authorized bandwidth by more than 125% up to and including 250% of the authorized bandwidth.

(4) At least $56 + 10 \log_{10}(T)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

The following plot shows the test results.



Date: 18.JUL.2005 15:39:25

The unit does meet the FCC requirements.

5.4 Frequency Stability

Test Requirement: FCC Part 95 Section 95.623
Test Method: Based on ANSI C 63.4.
Test Date: 22 June 2005
Requirements: All other R/C transmitters that transmit in the 72-76 MHz frequency band must be maintained within a frequency tolerance of 0.002% (20ppm).

Test Method:

Frequency measurements were made as follows:

(a) at 10 degree intervals of temperatures between -30°C and +50°C at the manufacturer's rated supply voltage, and

(b) at +20°C temperature and ±15% supply voltage variations.

Note, for handheld equipment that is only capable of operating from internal batteries, reduce the primary supply voltage to the battery operating end point. The manufacturer should specify the battery operating endpoint voltage of the equipment.

Test Results:

Frequency Stability vs. Temperature

Assigned Frequency(MHz)	Temperature (°C)	Measured Frequency(MHz)	Frequency Deviation (KHz)	Limit (KHz)
72.15000	-30	72.15078	0.780	1.440
	-20	72.15064	0.640	1.440
	-10	72.15050	0.500	1.440
	0	72.15098	0.980	1.440
	+10	72.15092	0.920	1.440
	+20	72.15076	0.760	1.440
	+30	72.15050	0.500	1.440
	+40	72.15034	0.340	1.440
	+50	72.15006	0.060	1.440

Frequency Stability vs. Supply Voltage

Nominal Voltage: 9.6VDC

Temperature: 20°C

Assigned Frequency(MHz)	Voltage (V)	Measured Frequency(MHz)	Frequency Deviation (KHz)	Limit (KHz)
72.015MHz	9.6	72.15090	0.900	1.440
	9.0	72.15084	0.840	1.440
	8.0	72.15080	0.800	1.440
	7.0	72.15078	0.780	1.440

Remark: The applicant declared the endpoint voltage 7.0Vdc.

It will give the operation guidance to the customer in user manual.

The unit does meet the FCC requirements.



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5.5 Crystal Access Restrictions

The EUT has no control knobs, switches, or other type of adjustments either on the operating front panel or on the exterior of the transmitter enclosure, which when manipulated can result in violation of the rules. The plug in crystal is not accessible to the user.