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FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

Report No.: GLEMR070300673RFT

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FCC ID: U5Q07548171759

FCC TEST REPORT

Application No. : GLEMR070300673RF
Applicant: SHANTOU LANYU MODEL INDUSTRIAL CO., LTD.
FCC ID: U5Q07548171759
Fundamental Frequency: 27.145MHz
Equipment Under Test (EUT):
EUT Name: R/C PLANE SERIES.
Model No.: Tw-742, Tw-738, Tw-743, Tw-746, Tw-745, Tw-747, Tw-748, Tw-749, Tw-750, Tw-751 ♣
♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.
Standards: FCC Part 95: 2006
Date of Receipt: 16 March 2007
Date of Test: 16 March 2007 to 17 April 2007
Date of Issue: 18 April 2007

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

Authorized Signature:

Jerry Chen
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.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.
All test results in this report can be traceable to National or International Standards.

2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Flied Strength of Fundamental	FCC Part 95: 2006	Section 95.639	PASS
Flied Strength of Harmornics or other Frequency	FCC Part 95: 2006	Section 95.635	PASS *
Emission Bandwidth	FCC Part 95: 2006	Section 95.633	PASS *
Frequency Stability	FCC Part 95: 2006	Section 95.623	PASS

♣ Remark:

Item No.: Tw-742,Tw-738,Tw-743, Tw-746, Tw-745, Tw-747, Tw-748, Tw-749, Tw-750, Tw-751

According to the confirmation from the applicant, only the Item Tw-742 was tested, since the electrical circuit design, PCB layout, components used and internal wiring were identical for the above items, only the outer decoration. color and item numbers were different.

*The EUT pass Flied Strength of Fundamental and Emission Bandwidth test after modification carried out as following:

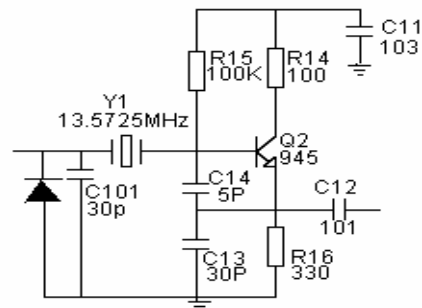
(1) as right graph

Change parameter of capacitor

C14: 47pF to 5.0 pF,

C13 :56 pF to 30 pF;

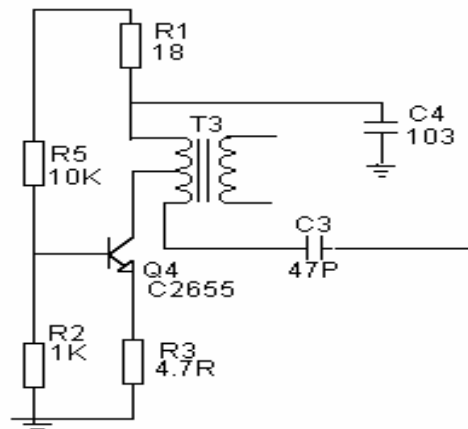
R16: 1KΩ to 330Ω



(2)

Add one capacitor C4:103 and add one resistor

R1:18Ωas follow picture show:



(3) Adjust T1,T2,T4 of the circuit, suppress the spurious emission.



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4 General Information

4.1 Client Information

Applicant Name: SHANTOU LANYU MODEL INDUSTRIAL CO., LTD.
Applicant Address: Floor 3, Workshop, Zhong Cheng Marketplace, Dong Xia Bei Road, Shan
Tou City, Guang Dong, China.

4.2 General Description of E.U.T.

EUT Name: R/C PLANE SERIES.
Model No.: Tw-742, Tw-738, Tw-743, Tw-746, Tw-745, Tw-747, Tw-748, Tw-749, Tw-
750, Tw-751
Function: Radio control plane, used 27.145MHz as carrier.
EUT Power Supply: 1.5V x8'AA' Battery for Tx ;
9.6V Rechargeable Battery for Rx.

4.3 Description of Support Units

The EUT was tested as an independent unit.

4.4 Test Location

All tests were performed at:-

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory, No.198 Kezhu
Road, Science Town Economic & Technology Development District Guangzhou, China 510663

Tel: +86 20 8215 5555 Fax: +86 20 8207 5059

No tests were sub-contracted.

4.5 Other Information Requested by the Customer

None.

4.6 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.

- **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.

- **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.

- **CNAS L0167**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 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 authorized test laboratory for the DoC process.

- **Industry Canada (IC)**

The 3m/10m Alternate 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.: 4620B-1.

Date of Registration: Jan 15, 2007. Valid until Jan 15, 2009

- **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.: R-2460 and C-2584 respectively.

This certificate is valid until September 14, 2009

5 Test Results

5.1 Test Instruments



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No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0039	Temperature Chamber	TERCHY	MHG-800RR	0118	05-12-2006	05-12-2007
EMC0009	D.C. Power Supply	Instek	PS-3030	9862036	Check when used	
EMC0007	DMM	Fluke	73	70671122	27-09-2006	27-09-2007
EMC0006	DMM	Fluke	73	70681569	27-09-2006	27-09-2007
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	06-03-2007	06-03-2008
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	22-08-2006	22-08-2007
EMC0502	Biconical Antenna (Rx)	Rohde & Schwarz	HK116	100032	31-07-2006	31-07-2007
EMC0503	Biconical Antenna (Tx)	Rohde & Schwarz	HK116	100033	31-07-2006	31-07-2007
EMC0504	Log-Perd. Dipole Antenna (Rx)	Rohde & Schwarz	HL223	100039	31-07-2006	31-07-2007
EMC0505	Log-Perd. Dipole Antenna (Tx)	Rohde & Schwarz	HL223	100040	31-07-2006	31-07-2007
EMC0517	Horn Antenna (Rx)	Rohde & Schwarz	HF906	100095	29-07-2006	29-07-2007
EMC0519	Bilog Type Antenna	Schaffner Chase	CBL6143	5070	31-07-2006	31-07-2007
EMC0520	0.1-1300 MHz Pre Amplifier	HP	8447D OPT 010	2944A06252	06-03-2007	06-03-2008
EMC0521	1-26.5GHz Pre Amplifier	Agilent	8449B	3008A01649	06-03-2006	06-03-2007
EMC0507	Antenna Mask (Tx)	HD-GmbH	AS620M	620/408	N/A	N/A
EMC0508	Antenna Mask (Rx)	HD-GmbH	MA240	240/619	N/A	N/A
EMC0509	Turntable	HD-GmbH	DT430	N/A	N/A	N/A
EMC0510	Turntable & Antenna Mask Controller	HD-GmbH	HD100	N/A	N/A	N/A
EMC0512	EMI Test Software	Rohde & Schwarz	ES-K1	N/A	N/A	N/A
EMC0511	Coaxial cable	Rohde & Schwarz	N/A	N/A	04-11-2006	03-11-2007
EMC0514	Coaxial cable	Rohde & Schwarz	N/A	N/A	04-11-2006	03-11-2007
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	05-12-2006	05-12-2007
EMC0040	Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	05-12-2006	05-12-2007
EMC0516	Signal Generator	Rohde & Schwarz	SMR20	100416	05-12-2006	05-12-2007
EMC0032	Radio Communication Monitor	Rohde & Schwarz	CMS54	100137	20-12-2006	20-12-2007
EMC0904	Power Meter	Rohde & Schwarz	NRVS	825770/074	22-07-2006	22-07-2007
EMC0905	Power Sensor	Rohde & Schwarz	NRV-Z5	825802/013	22-07-2006	22-07-2007
EMC0906	Dual Directional Coupler	Werlatone Inc.	C1795	6634	20-11-2006	20-11-2007
EMC1508	Audio Analyzer	Rohde & Schwarz	UPL	100855	11-09-2006	11-09-2007
EMC1005	Digital Oscilloscope	Tektronix	TDS3012	B015508	14-07-2006	14-07-2007
EMC0523	Active Loop Antenna	EMCO	6502	00042963	09-08-2006	09-08-2008
EMC0001	Temp. Humidity/Barometer	Oregon Scientific	BA-888	EMC0001	20-09-2007	20-09-2008

5.2 E.U.T. Operation

Input voltage: 1.5V x8'AA' Battery for Tx
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 Flied Strength of Fundamental

Test Requirement: FCC Part 95 Section 95.639
Test Method: Based on TIA 603
Test Date: 26 March 2007
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 26-27 MHz frequency band, except on channel ffrequency 27.255MHz the limit is 4 W.

Test Procedure:

Test Method: The procedure uesd was TIA 603.

a. The technique used to find the Flied Strength of Fundamental of the transmitter following the test procedure below:

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.

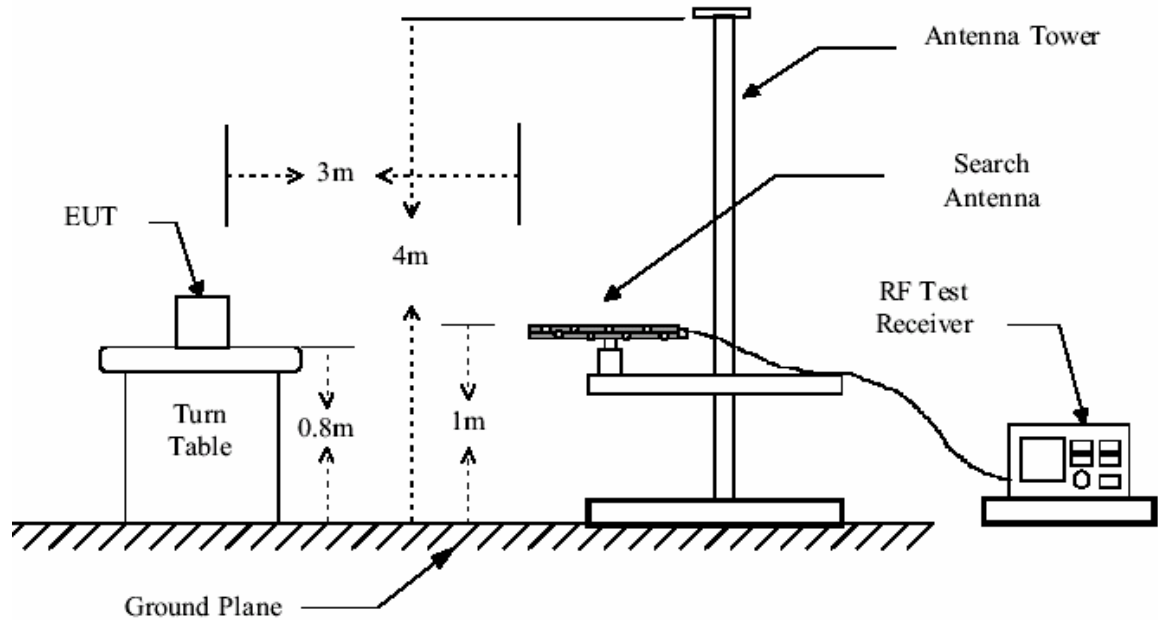
2. The fundamental frequency (27.145MHz) of the transmitter was maximized on the test Receiver display by raising and lowering the receive antenna and by rotating the turntable. After the fundamental emission was maximized, a field strength measurement was made.

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.

b. Transmitter output power (TP):

The RF transmitter power was measured at the transmitter oputput antenna terminals by a spectrume analyzer.

Test Configuration:



Test result:

The highest field strength measured at the fundamental frequency (27.145MHz) was 97.3dB μ V/m at a distance of 3 meters.

The transmitter output power found at the antenna terminal using the conducted method was 15.8mW.

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 TIA 603.
 Test Date: 26 March 2007
 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 $43 + 10\log_{10}(TP)$ 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: 27.145 MHz

Measurement Distance: 3m

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

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

$97.3 \text{ dBuV/m} - [43 + 10\log_{10}(15.8\text{mW}/1000)] = 72.3\text{dBuV/m}$

The field strength of the spurious emissions should not exceed 72.3dBuV/m

Test Procedure:

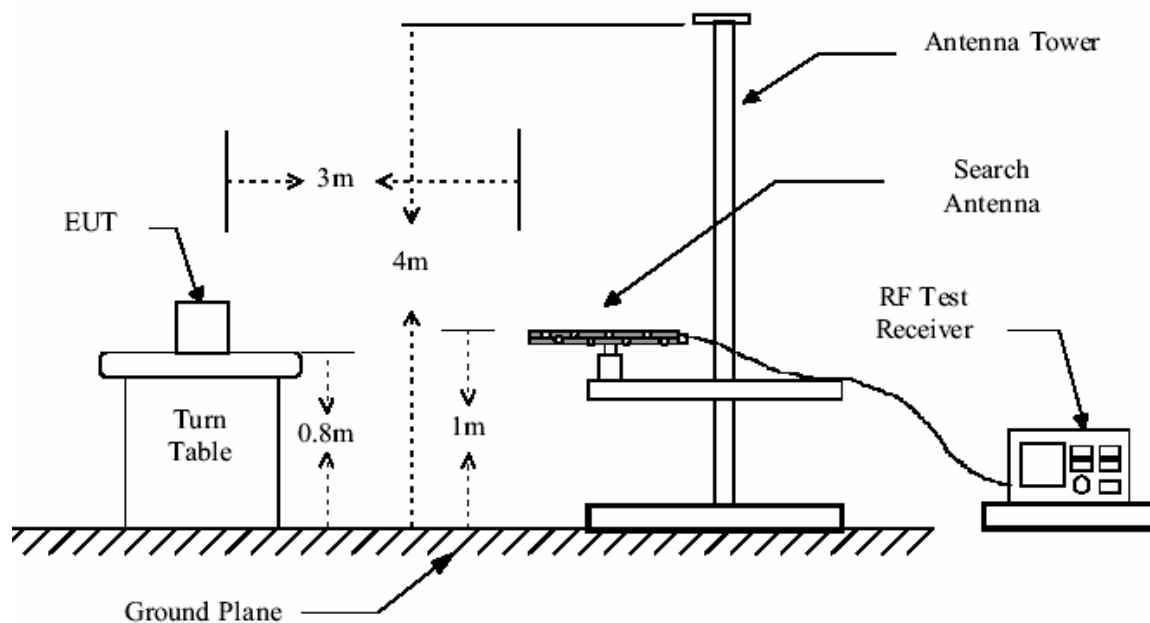
Below 30MHz

Test Procedure: For testing performed with the loop antenna, testing was performed in accordance to TIA 603. 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.

Above 30MHz

The procedure used was TIA 603. 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:



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 – Peramplifier Factor

The following test results were performed on the EUT:

Quasi-Peak Measurement

Vertical:

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Peramplifier Factor	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
39.700	12.3	0.6	25.3	73.7	61.3	72.3	-11.0
52.310	8.0	0.7	25.3	64.9	48.4	72.3	-24.0
66.860	6.4	0.7	25.1	52.4	34.4	72.3	-37.9
79.470	6.9	0.8	25.1	53.4	35.9	72.3	-36.4
94.020	8.1	0.8	25.2	57.1	40.9	72.3	-31.4
106.630	9.4	0.9	25.1	62.4	47.6	72.3	-24.7
121.180	10.8	1.0	25.1	56.2	42.9	72.3	-29.4
133.790	11.7	1.0	25.1	53.8	41.4	72.3	-30.9
148.340	9.3	1.1	24.9	53.4	38.8	72.3	-33.5
291.900	13.0	1.6	24.4	28.7	18.9	72.3	-53.5

Horizontal:

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Peramplifier Factor	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
39.700	16.4	0.6	25.3	48.0	39.7	72.3	-32.6
52.310	11.5	0.7	25.3	48.4	35.4	72.3	-36.9
106.630	11.1	0.9	25.1	44.3	31.2	72.3	-41.1
133.790	12.3	1.0	25.1	56.4	44.7	72.3	-27.6
148.340	10.9	1.1	24.9	57.6	44.7	72.3	-27.6
160.950	9.6	1.2	24.9	49.7	35.6	72.3	-36.7
188.110	8.8	1.3	24.7	51.8	37.2	72.3	-35.1
202.660	9.2	1.3	24.6	50.9	36.9	72.3	-35.5
215.270	10.5	1.4	24.5	48.7	36.0	72.3	-36.3
39.700	16.4	0.6	25.3	48.0	39.7	72.3	-32.6

The unit does meet the FCC requirements.

5.3.3 Emission Bandwidth

Test Requirement: FCC Part 95 Section 95.633

Test Method: Based on TIA 603.

Test Date: 21 March 2007(initial test); 17 April 2007(Final test)

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.

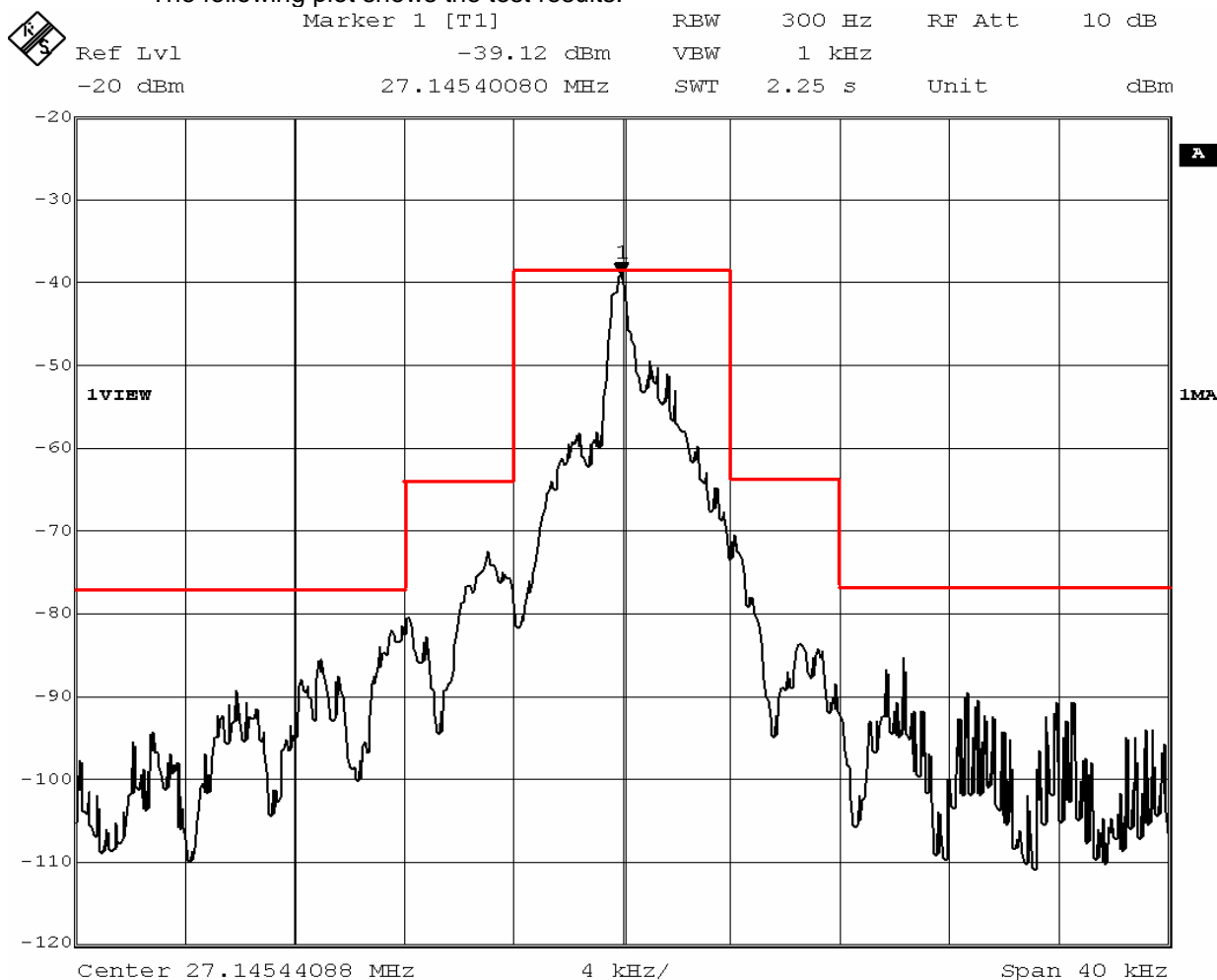
The power of each unwanted emission shall be less than the transmitter power (TP) by:

(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 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

(3) At least $43 + 10 \log_{10}(T)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

The following plot shows the test results.



Date: 17.APR.2007 16:24:32

The unit does meet the FCC requirements.

5.4 Frequency Stability

Test Requirement: FCC Part 95 Section 95.623
Test Method: Based on TIA 603.
Test Date: 17 April 2007
Requirements: Each R/C transmitter that transmits in the 26–27 MHz frequency band with a mean TP of 2.5 W or less and that is used solely by the operator to turn on and/or off a device at a remote location, other than a device used solely to attract attention, must be maintained within a frequency tolerance of 0.01%.

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)
27.145	-30	27.145720	0.720	2.71
	-20	27.145500	0.500	2.71
	-10	27.145400	0.400	2.71
	0	27.145352	0.352	2.71
	+10	27.145390	0.390	2.71
	+20	27.145425	0.425	2.71
	+30	27.145520	0.520	2.71
	+40	27.145560	0.560	2.71
	+50	27.145600	0.600	2.71

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)
27.145	12.0	27.145425	0.425	2.71
	10.2	27.145637	0.637	2.71
	9.0	27.145690	0.690	2.71
	4.6	27.145710	0.710	2.71

Remark: The applicant declared the endpoint voltage 4.6Vdc.

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

The unit does meet the FCC requirements.