Test Report of FCC Part 15 C for FCC Certificate

On Behalf of

Guangdong Yinrun Industry Co., LTD.

Product description:	**Toy-R/C Robot Car Jr**
Model No.:	**9004**
FCC ID:	**XHT9004-49M**

Prepared for:	**Guangdong Yinrun Industry CO., LTD.** Yinrun Ind. Garden, Laimei Zone, Chenghai, Shantou City, Guangdong, China
Prepared by:	**Bontek Compliance Testing Laboratory Ltd** 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China. Tel: 86-755-86337020 Fax: 86-755-86337028
Report No.:	BCT09FR-506E
Issue Date:	June 28, 2009
Test Date:	June 15~18, 2009

Test by: **Reviewed by:**

Kendy Wang

Tony Wu

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	**Guangdong Yinrun Industry CO., LTD.**
Address of applicant:	Yinrun Ind, Garden, Laimei Zone, Chenghai, Shantou City, Guangdong, China
Manufacturer:	**Guangdong Yinrun Industry CO., LTD.**
Address of manufacturer:	Yinrun Ind, Garden, Laimei Zone, Chenghai, Shantou City, Guangdong, China

EUT Description:	Toy-R/C Robot Car Jr
Trade Name:	N/A
Model No.:	9004
Rated Voltage	DC 9V laminated battery for transmitter
Frequency range	49.862MHz
Number of channels	1
Channel Separation	None
Product Class:	Low Power Communication Device Transmitter
Measurement Procedure	ANSI C63.4-2003

Remark: * *The test data gathered are from the production sample provided by the manufacturer.*

1.2 Related Submittal(s) / Grant (s)

This submittal(s) is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 - 2003.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.235 rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 - 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

All measurement required was performed at laboratory of Bontek Compliance Testing Laboratory Ltd at 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China.

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

FCC – Registration No.: 338263

Bontek Compliance Testing Laboratory 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 338263, March 24, 2008.

IC Registration No.: 126111

The 3m alternate test site of Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 126111 on March, 2008.

2. SYSTEM TEST CONFIGURATION

The tests documented in this report were performed in accordance with ANSI C63.4-2003 and FCC CFR 47 Part 15 Subpart C.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

2.3 General Test Procedures

Conducted Emissions The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.1 of ANSI C63.4-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

Radiated Emissions the EUT is a placed on as turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

2.4 List of Measuring Equipments Used

Items	Equipment	Manufacturer	Model No.	Serial No.	Last Cal	Calibration Period
1	EMI Test Receiver	R&S	ESCI	100687	2009-2-21	1 Year
2	EMI Test Receiver	R&S	ESPI7	100097	2009-2-21	1 Year
3	Amplifier	HP	8447D	1937A02492	2009-2-21	1 Year
4	Single Power Conductor Module	FCC	FCC-LISN-5-50-1-01-CISPR25	07101	2009-2-21	1 Year
5	3 phase Artificial Mains（L.I.S.N）	SCHWARZBECK	NSLK 8128	8128247	2009-2-26	1 Year
6	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9163	9163-324	2009-2-21	1 Year
7	Horn Antenna	SCHWARZBECK	BBHA9120A	D69250	2009-2-26	1 Year
8	High Field Biconical Antenna	ELECTRO-METRICS	EM-6913	166	2009-9-03	1 Year
9	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	811	2009-9-03	1 Year
10	Remote Active Vertical Antenna	ELECTRO-METRICS	EM-6892	304	2009-9-03	1 Year
11	Power Clamp	SCHWARZBECK	MDS-21	3812	2009-2-21	1 Year
12	Single Power Conductor Module	FCC	FCC-LISN-5-50-1-01-CISPR25	07102	2009-2-21	1 Year
13	Teo Line Single Phase Module	FCC	FCC-LISN-50-25-2-01	06061	2009-3-30	1 Year

3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
15.207	Disturbance Voltage at The Mains Terminals	N/A, without AC power supply
15.235	Radiation Emission	Pass
15.235	Occupied Bandwidth	Pass

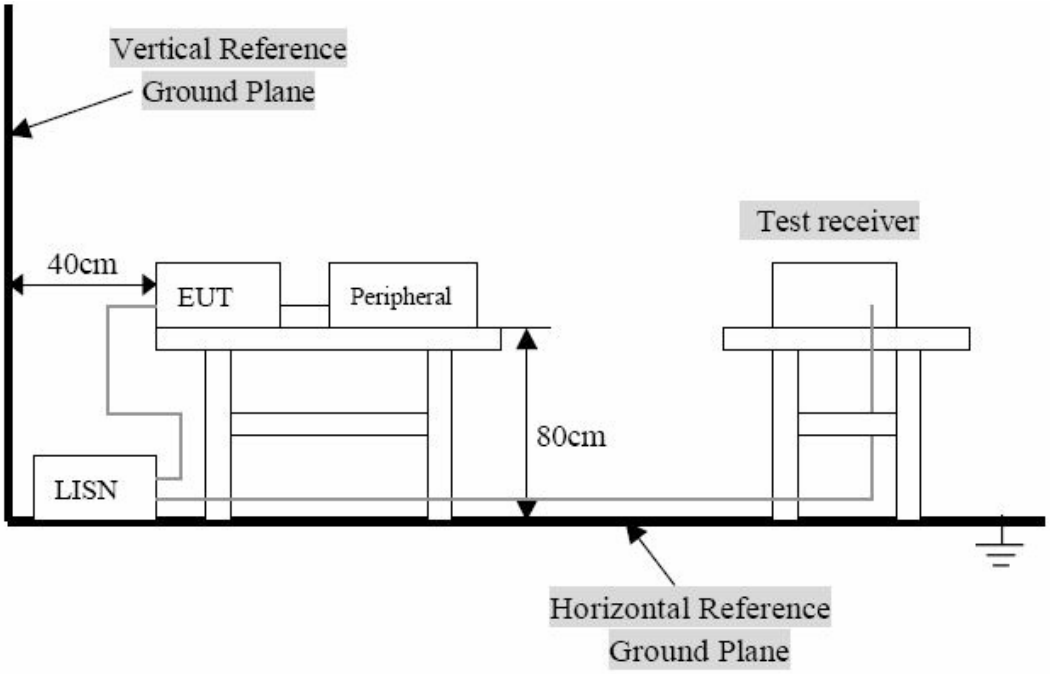
4. TEST OF CONDUCTED EMISSION

4.1 Applicable Standard

Section 15.207: For a Low-power Radio-frequency Device is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150～0.500	66～56	56～46
0.500～5.000	56	46
5.000～30.00	60	50

4.2 Test Setup Diagram



Remark: 1. The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC 15.207 limits.

2. The EUT is exclused from investigation of Disturbance Voltage at The Mains Terminals, for it is powered by DC 9V laminated bettary. According to the Section 15.207(d),measurement to demonstrate compliance with the limits of Disturbance Voltage at The Mains Terminals are not required to the devices which only employed bettary power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

5- RADIATED EMISSIONS

5.1 Limit of Radiated Emissions

Limits of Spurious Emissions (Fcc 47 Cfr 15.209 Class B):

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dBμV/m)
30 ~ 88	3	40
88~216	3	43.5
216 ~ 960	3	46
960 ~ 1000	3	54

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

(2) The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

5.2 Test Equipment Used

Items	Equipment	Manufacturer	Model No.	Serial No.	Last Cal	Calibration Period
1	EMI Test Receiver	R&S	ESCI	100687	2009-2-21	1 Year
2	EMI Test Receiver	R&S	ESPI7	100097	2009-2-21	1 Year
3	Amplifier	HP	8447D	1937A02492	2009-2-21	1 Year
4	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9163	9163-324	2009-2-21	1 Year
5	Horn Antenna	SCHWARZBECK	BBHA9120A	D69250	2009-2-26	1 Year

5.3 EUT Setup

Radiated Measurement Setup

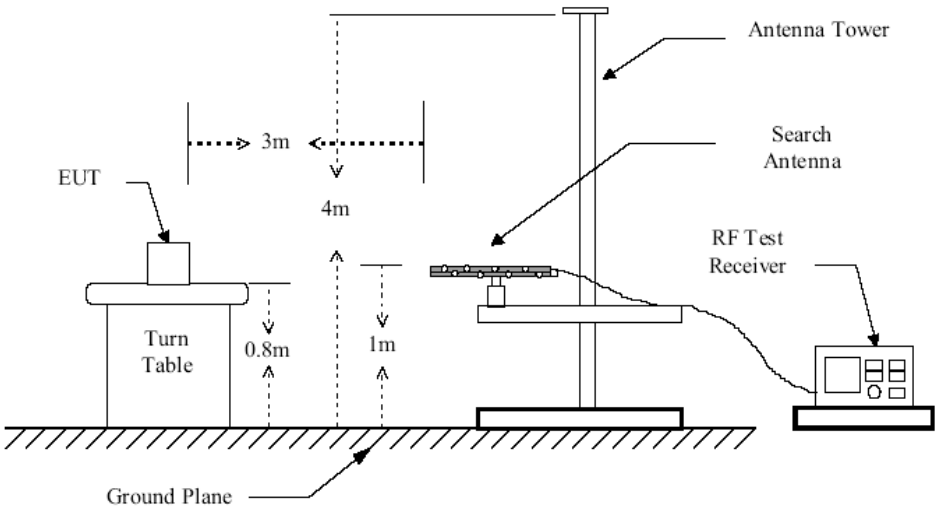


Figure 1 : Frequencies measured below 1 GHz configuration

5.4 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

1). Configure the EUT according to ANSI C63.4:2003.

2). The EUT was placed on the top of the turntable 0.8 meter above ground.

3). The receiving antenna was placed 3 meters far away from the turntable.

4). The turntable was rotated by 360 degrees to determine the position of the highest radiation.

5). For Spurious Emissions test, The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization. For each suspected emission, the antenna tower was scanned (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.

5.5 Test Result

Temperature (℃) : 22~23	EUT: Toy-R/C Robot Car Jr
Humidity (%RH): 50~54	M/N: 9004
Barometric Pressure (mbar): 950~1000	Operation Condition: Continuous Transmitting

Fundamental Emission Test Data

Peak Measurement					
Test Frequency (MHz)	Measuring Level (dBμV/m)		Limits (dBμV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
49.8625	83.92	74.25	100	16.08	25.75
Average Measurement					
49.8625	75.68	66.03	80	4.32	13.97

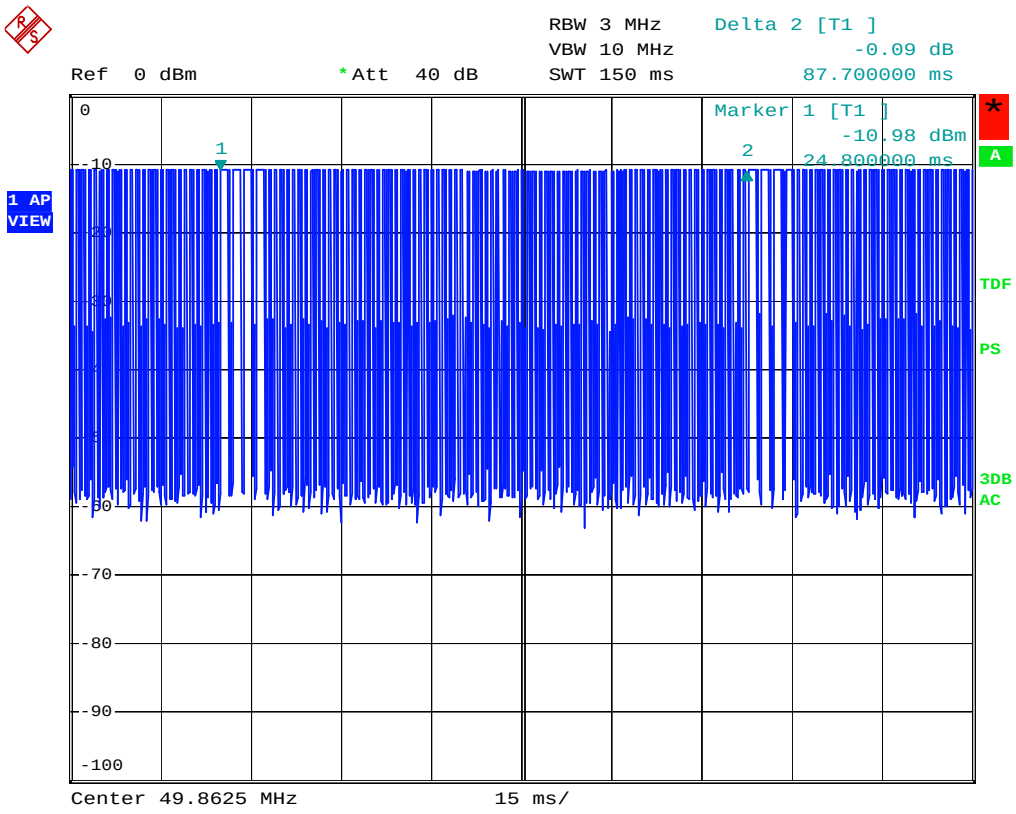
Remark: **Duty Cycle Correction**

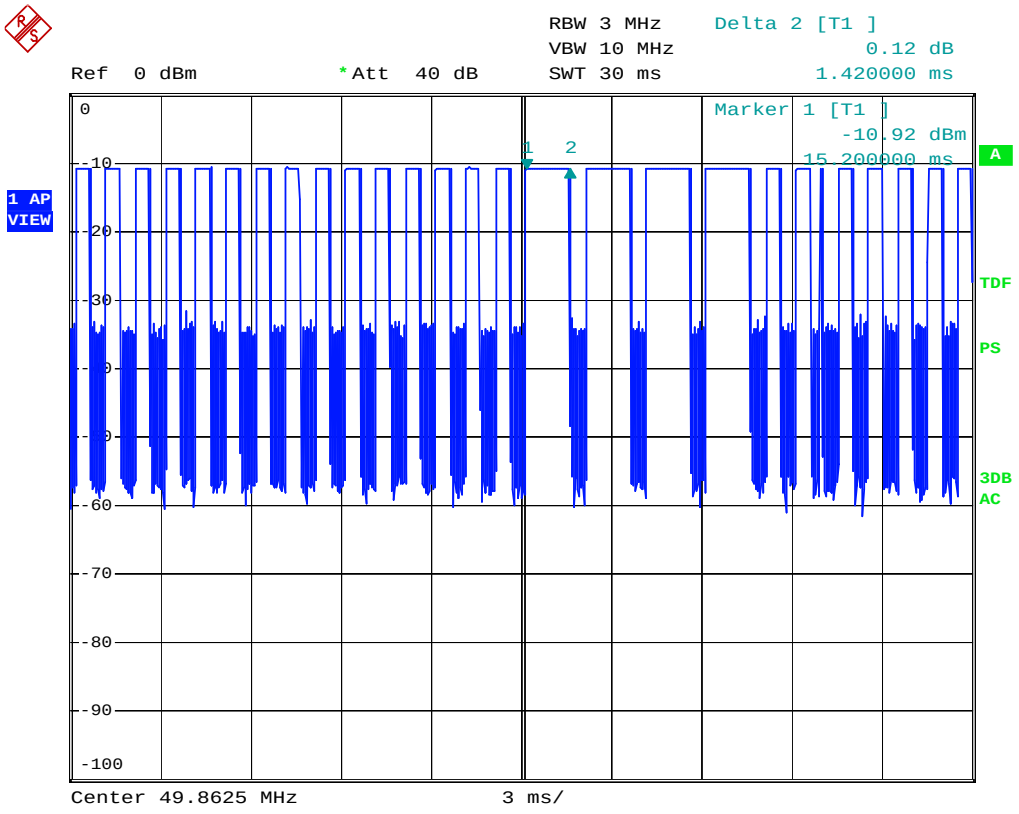
Each function key sends a different series of characters, but each packet period (87.7msec) never exceeds a series of 4 long (1.42msec) and 59 short (0.48msec) pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered 4x1.42msec+59x0.48msec per 87.7msec =38.8% duty cycle. Figure A through C show the characteristics of the pulse train for one of these functions.

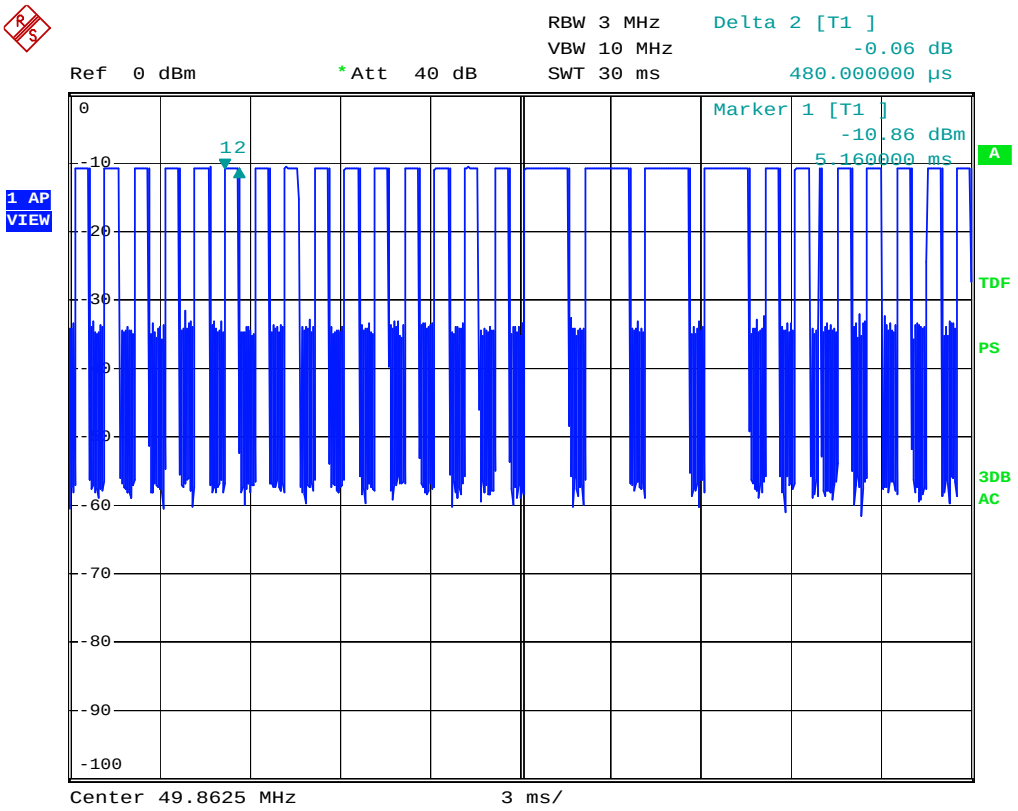
Duty Cycle Correction = 20Log(0.388) =-8.22dB
The following figures show the characteristics of the pulse train for one of these functions.

So, the radiation(average)= 83.9+20*log(0.388)=75.68(dBμV/m)

Result: The field strength of any emission within the operation band did not exceed 80(dBμV/m) for average value or 100 dB(dBμV/m)for peak value.


RBW 3 MHz
Delta 2 [T1]
VBW 10 MHz
-0.09 dB
Ref 0 dBm
*Att 40 dB
SWT 150 ms
87.700000 ms
Marker 1 [T1]
-10.98 dBm
24.800000 ms
1 AP
VIEW
TDF
PS
3DB
AC
0
-10
-70
-80
-90
-100
Center 49.8625 MHz
15 ms/


RBW 3 MHz
VBW 10 MHz
SWT 30 ms
Delta 2 [T1]
0.12 dB
1.420000 ms
Ref 0 dBm
*Att 40 dB
Marker 1 [T1]
-10.92 dBm
15.200000 ms
1 AP
VIEW
A
TDF
PS
3DB
AC
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Center 49.8625 MHz
3 ms/


RBW 3 MHz
Delta 2 [T1]
VBW 10 MHz
-0.06 dB
SWT 30 ms
480.000000 µs
Ref 0 dBm
*Att 40 dB
Marker 1 [T1]
-10.86 dBm
5.160000 ms
1 AP
VIEW
A
TDF
PS
3DB
AC
0
-10
-20
-30
-40
-60
-70
-80
-90
-100
12
Center 49.8625 MHz
3 ms/

Harmonics & Spurious Emission

49.860MHz Spurious Emission						
Maximum Frequency (MHz)	Position and Level				Limit	Margin
	Polarity	Value dBμV/m	Transd	Result dBμV/m	dBμV/m	dBμV/m
99.725	V	28.4	11.2	39.6	43.5	3.9
149.586	V	22.1	10.7	32.8	43.5	10.7
199.448	V	26.5	10.9	37.4	43.5	6.1
249.310	V	26.7	11.5	38.2	46	7.8
299.172	V	16.7	14.9	31.6	46	14.4
349.034	V	13.4	19.4	32.8	46	13.2
398.896	V	8.7	22.9	31.6	46	14.4
448.758	V	13.2	22.1	35.3	46	10.7
498.624	V	11.1	22.5	33.6	46	10.4
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Maximum Frequency (MHz)	Position and Level				Limit	Margin
	Polarity	Value dBμV/m	Transd	Result dBμV/m	dBμV/m	dBμV/m
99.725	H	24.7	11.5	36.2	43.5	7.3
149.586	H	15.6	10.9	26.5	43.5	17.0
199.448	H	17.7	10.6	28.3	43.5	15.2
249.310	H	13.3	12.1	25.4	46	20.6
299.172	H	14.4	14.1	28.5	46	17.5
349.034	H	9.7	20.5	30.2	46	15.8
398.896	H	4.6	22.8	27.4	46	18.6
448.758	H	5.1	23.0	28.1	46	17.9
498.624	H	5.7	23.2	28.9	46	17.1
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Remark:

--- Means that The emission level of the rest measuring harmonic up to 5GHz are so low below applicable limit in operation mode, so the result were not recorded.

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

Transd. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

6- OCCUPIED BANDWIDTH

6.1 Limit of Occupied Bandwidth

The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the un-modulated carrier or to the general limits of 15.209, whichever permits the higher emission levels.

6.2 Test Equipment Used

Items	Equipment	Manufacturer	Model No.	Serial No.	Last Cal	Calibration Period
1	EMI Test Receiver	R&S	ESCI	100687	2009-2-21	1 Year
2	EMI Test Receiver	R&S	ESPI7	100097	2009-2-21	1 Year
3	Amplifier	HP	8447D	1937A02492	2009-2-21	1 Year
4	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9163	9163-324	2009-2-21	1 Year
5	Horn Antenna	SCHWARZBECK	BBHA9120A	D69250	2009-2-26	1 Year

6.3 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

1). Configure the EUT according to ANSI C63.4:2003.

2). The EUT was placed on the top of the turntable 0.8 meter above ground.

3). The receiving antenna was placed 3 meters far away from the turntable.

4). The turntable was rotated by 360 degrees to determine the position of the highest radiation.

5). For Spurious Emissions test, The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization. For each suspected emission, the antenna tower was scanned (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.

6.4 Occupied Bandwidth Test Result

Temperature (℃) : 22~23

Humidity (%RH): 50~54

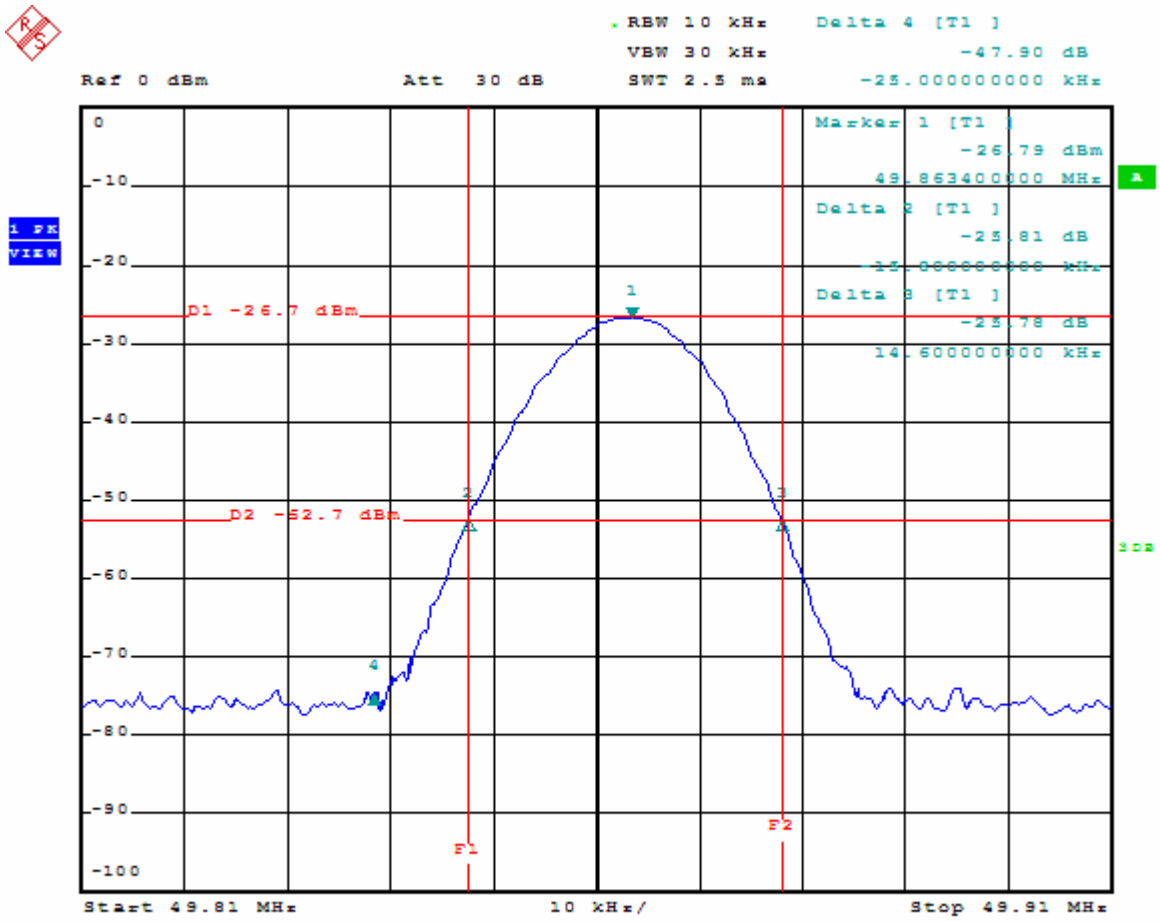
Barometric Pressure (mbar): 950~1000

EUT: Toy-R/C Robot Car Jr

M/N: 9004

Operation Condition: Continuous Transmitting

Test plots see following:



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7. ANTENNA REQUIREMENT

7.1 Standard Applicable

Section 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. 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 antenna is a 26.5cm long non-telescoping wire. It is connected with a fixable screw in the PCB. It is compliance with the requirement of unique coupling to the intentional radiator.