TEST REPORT No.: (5216)159-0989(B)

TEST REPORT

To:	**NKOK, INC.**	To:	-
Attn:	Lanny Halim	Attn:	-
Address:	5354 Irwindale Ave, Unit A, Irwindale, CA 91706	Address:	-
Fax:	(626) 330-1199	Fax:	-
E-mail:	testing@nkok.com	E-mail:	-
Folder No.:	--		

Factory Name:	**--**
Location:	--
Product:	14" L RC Classic ECTO – 1(Lights & Sounds) MODEL: 6612

Sample No:	(5216)162-0550
Date of Receipt:	June 07, 2016
Test Date(s):	June 16, 2016
Test Requested:	FCC Part 15 – 2015
Test Method:	ANSI C63.10 – 2013
FCC ID:	XQPZC061627TX

The results given in this report are related to the tested specimen of the described electrical apparatus.

CONCLUSION: The submitted sample was found to COMPLY with requirement of FCC Part 15 Subpart C.

Authorized Signature:

Reviewed by: Keith Yeung	Approved by: Law Man Kit
Date: June 24, 2016	Date: June 24, 2016

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Test Result Summary

EMISSION TEST			
Test requirement: FCC Part 15 – 2015			
Test Condition	Test Method	Test Result	
		Pass	Failed
Radiated Emission Test, 9kHz to 1GHz	ANSI C63.10	☒	☐
Frequency range of Fundamental Emission	ANSI C63.10	☒	☐
26dB Bandwidth of Fundamental Emission	ANSI C63.10	☒	☐
Duty Cycle Correction During 100mesc	ANSI C63.10	☒	☐

Report Revision & Sample Re-submit History:

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Test Laboratory & Test Instruments List

Radiated and Conducted emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.10 – 2013. An Open Area Test Site and Full Anechoic are set up for investigation and located at:

BUREAU VERITAS HONG KONG LIMITED, EMC CENTRE

No. 2106-2107, 21/F., Westin Centre,
26 Hung To Road,
Kwun Tong, Kowloon,
Hong Kong

Test Instrument List

Radiated Emission

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE	CAL. DUE DATE
EMI TEST RECEIVER	R&S	ESCI	100379	23-FEB-2016	22-FEB-2017
SIGNAL ANALYZER 40GHZ	R&S	FSV 40	100977	30-JUN-2015	29-JUN-2016
BILOG ANTENNA	SCHAFFNER	CBL6112D	25229	27-FEB-2016	26-FEB-2018
OPEN AREA TEST SITE	BVCPS	N/A	N/A	19-JUN-2015	18-JUN-2016
ANECHOIC CHAMBER	ALBATROSS	M-CDC	80374004499B	11-MAY-2016	10-MAY-2017
BICONICAL ANTENNA	R&S	HK116	100179	14-APR-2016	13-APR-2018
LOG-PERIODIC DIPOLE ARRAY ANTENNA	R&S	HL223	832369/001	07-APR-2016	06-APR-2018
LOOP ANTENNA	ETS-LINDGREN	6502	00102266	06-NOV-2015	05-NOV-2017
COAXIAL CABLE	SUHNER	N/A	N/A	07-JAN-2016	06-JAN-2017

Measurement Uncertainty

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	9kHz to 30MHz	4.2dB
	30MHz to 200MHz	4.5dB
	200MHZ to 1GHz	5.6dB
	1GHz to 18GHz	4.7dB
	18GHz to 40GHz	5.2dB

Remarks: -

N/A: Not Applicable or Not Available

The measurement instrumentation uncertainty would be taking into consideration on each of the test result

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Equipment Under Test [EUT]

Description of Sample:

Model Name:	14” L RC Classic ECTO – 1 (Lights & Sounds)
Model Number:	6612
Additional Model Name:	--
Additional Model Number:	--
Additional Model information:	--
Rating:	3Vd.c. (“AA” size battery x 2)

Description of EUT Operation:

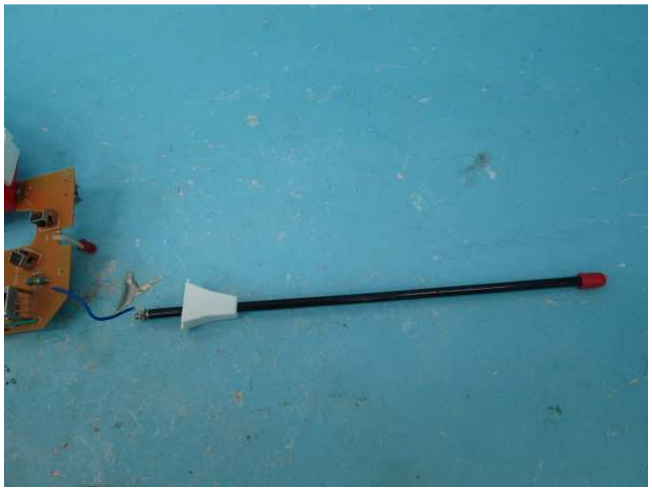
The Equipment Under Test (EUT) is a **NKOK, INC.** of Radio Control toy. It is a 1 wheel, 1 trigger and operating at 27.146MHz transmitter. The EUT continues to transmit while trigger is being pressed, Modulation by IC, and type is pulse modulation.
The transmitter has different control:

1. Wheel – control left and right
2. Trigger– control forward and backward
3. ON/OFF switch – control power on/off

Antenna Requirement (Section 15.203)

The EUT is use of a permanently antenna. The antenna consists of 20cm long metal spring covered with rubber. It is soldered on the PCB. The antenna is not replaceable or user serviceable. The requirements of S15.203 are met. There are no deviations or exceptions to the specifications.

Photo of Antenna



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Test Results

Radiated Emissions (Fundamental)

Test Requirement:	FCC Part 15 Section 15.227
Test Method:	ANSI C63.10 Clause 6.5
Test Date(s):	2016-06-16
Temperature:	31.0 °C
Humidity:	76.0 %
Atmospheric Pressure:	100.3 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	3Vd.c. (“AA” size battery x 2)

Test Method:

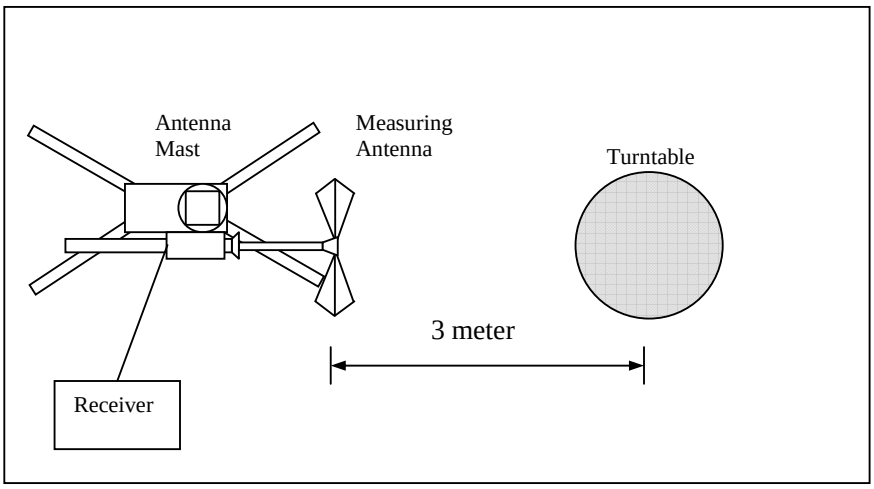
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.10 – 2013.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground for measurement frequency below 1GHz and 1.5m high above the ground for measurement frequency above 1GHz. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using new battery. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.

Location: The Roof, Westin Centre, 26 Hung To Road, Kwun Tong, Kowloon, Hong Kong

Test Setup: Open Area Test Site



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TEST REPORT No.: (5216)159-0989(B)

Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.227]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Peak] [μV/m]	Field Strength of Fundamental Emission [Average] [μV/m]
26.96 – 27.28	100,000 (100 dBμV/m)	10,000 (80 dBμV/m)

Measurement Data

Test Result of (Transmission mode): PASS

Detection mode: Peak

Frequency (MHz)	Polarity (H/V) and degree	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
27.146	V	9.7	54.7	100.0	-45.3

Detection mode: #Average

Frequency (MHz)	Polarity (H/V) and degree	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
27.146	V	9.7	**51.8	80.0	-28.2

For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.
**Duty Cycle Correction = 20Log(0.714) = -2.9dB

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 100KHz
VBW = 300KHz

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TEST REPORT No.: (5216)159-0989(B)

Radiated Emissions (9kHz – 1GHz)

Test Requirement:	FCC Part 15 Section 15.209
Test Method:	ANSI C63.10 Clause 6.5
Test Date(s):	2016-06-16
Temperature:	31.0 °C
Humidity:	76.0 %
Atmospheric Pressure:	100.3 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	3Vd.c. (“AA” size battery x 2)

Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]	Measurement Distance m
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above960	500	3

Measurement Data

Test Result of (Transmission mode): PASS

Detection mode: Quasi-Peak

Frequency	Polarity (H/V)	Field Strength	Limit	Margin (dB)
Emissions detected are more than 20 dB below the limit line(s) in 9kHz to 30MHz				

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Measurement Data

Test Result of (Transmission mode): PASS

Detection mode: Quasi-Peak

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
54.292	H	9.3	26.3	40.0	-13.7
81.438	H	9.1	20.7	40.0	-19.3
108.584	H	10.6	24.7	43.5	-18.8
135.730	H	12.2	24.6	43.5	-18.9
162.876	H	13.5	23.6	43.5	-19.9
190.022	H	14.7	25.0	46.0	-21.0
217.168	H	11.2	24.8	46.0	-21.2
244.314	H	11.8	26.1	46.0	-19.9
271.460	H	13.4	29.6	46.0	-16.4
298.606	H	13.6	29.7	46.0	-16.3

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
54.292	V	9.3	24.7	40.0	-15.3
81.438	V	9.1	20.9	40.0	-19.1
108.584	V	10.6	24.5	43.5	-19.0
135.730	V	12.2	25.0	43.5	-18.5
162.876	V	13.5	23.9	43.5	-19.6
190.022	V	14.7	25.6	46.0	-20.4
217.168	V	11.2	25.0	46.0	-21.0
244.314	V	11.8	25.7	46.0	-20.3
271.460	V	13.4	27.8	46.0	-18.2
298.606	V	13.6	28.5	46.0	-17.5

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz
VBW = 120KHz

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TEST REPORT No.: (5216)159-0989(B)

26dB Bandwidth of Fundamental Emission

Test Requirement:	FCC 47 CFR 15.227
Test Method:	ANSI C63.10 Clause 6.10
Test Date(s):	2016-06-16
Temperature:	31.0 °C
Humidity:	76.0 %
Atmospheric Pressure:	100.3 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	3Vd.c. (“AA” size battery x 2)

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Limits for 26dB Bandwidth of Fundamental Emission:

Frequency [MHz]	26dB Bandwidth [KHz]	Limits [MHz]
27.14624	28.8	within 26.96-27.28

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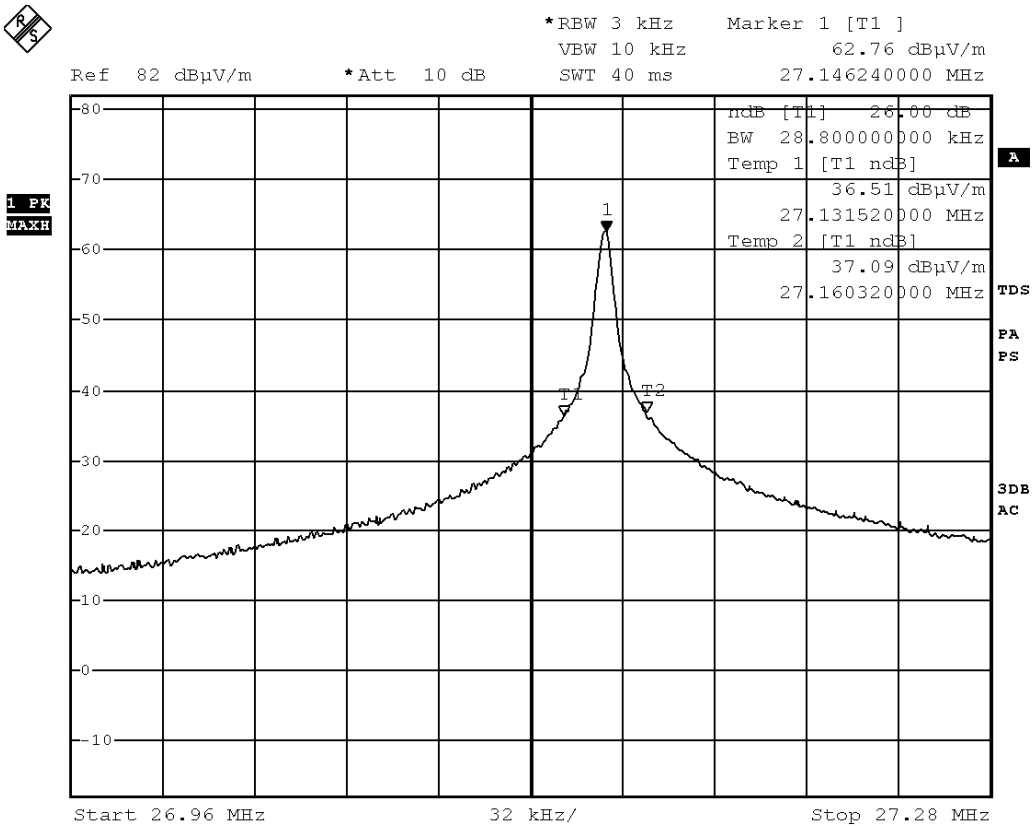
Measurement Data

Test Result of 26dB Bandwidth of Fundamental Emission: PASS



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Duty Cycle Correction During 100msec:

Each function key sends a different series of characters, but each packet period (100msec) never exceeds a series of 24 long (1.6msec) and 55 short (0.6msec) pulses. Assuming any combination of short and long pulses maybe obtained due to encoding the worst case transmit duty cycle would be considered (24 x 1.6msec)+(55 x 0.6msec) per 100msec = 71.4% duty cycle.

Remarks: -

Duty Cycle Correction = 20Log(0.714) = -2.9dB
Therefore, -20dB is taken

The following figures [Figure A to Figure B] show the characteristics of the pulse train for one of these functions.

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Figure A [Short Pulse]

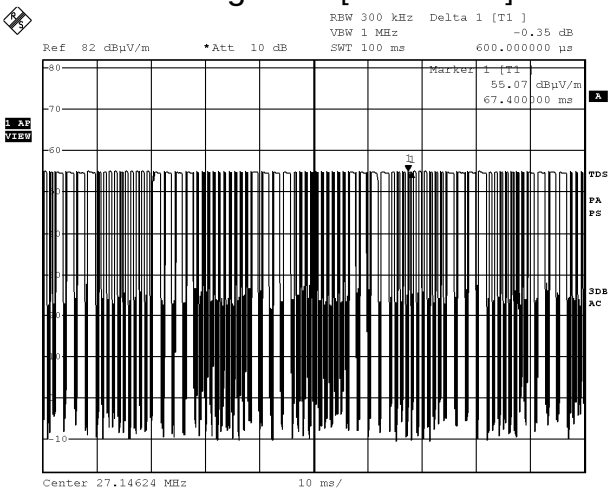

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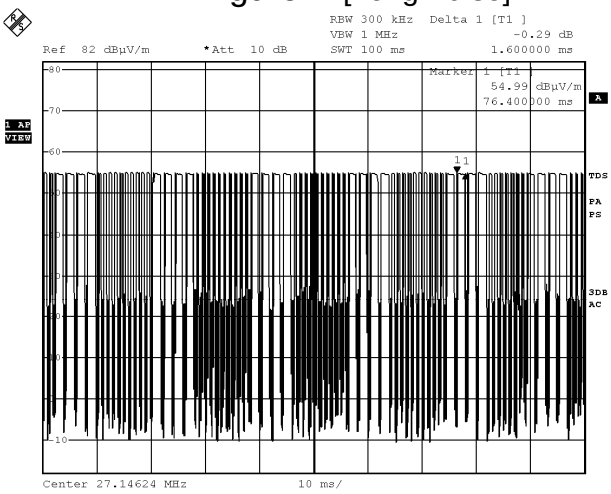
Figure B [Long Pulse]



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Photographs of EUT

Front View of the product

Rear View of the product

Top View of the product

Bottom View of the product

Side View of the product

Side View of the product

Battery compartment

Battery Cover

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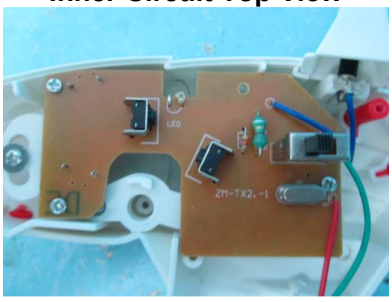
Photographs of EUT

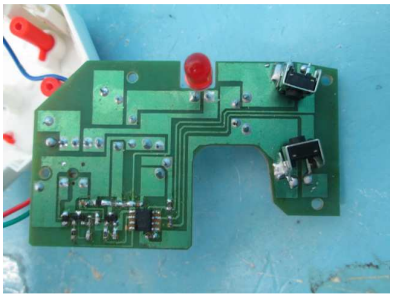
Internal View of the product

Internal View of the product

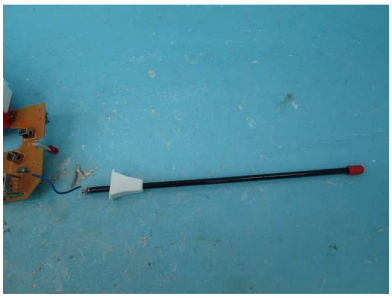
Inner Circuit Top View



Inner Circuit Bottom View



Antenna



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Measurement of Radiated Emission Test Set Up

******* End of Report *******

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