






**BUREAU
VERITAS**

TEST REPORT No.: (5215)132-1443(A)

TEST REPORT

To:	TOY STATE INTERNATIONAL LIMITED	To:	-
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Folder No.:	TSI-15MY096MTHS-B		
Factory Name:	SHENZHEN NANLING TOYS PRODUCTS LTD. CO.		
Location:	132 Busha Rd, Nanling Village, Bu Ji, Shenzhen, China		
Product:	1:16 Scale Assortment – Ford Fiesta RS WRC MODEL: 94130(94132) (Brand Name: Nikko) Additional models: (Please see page 4)		
	Sample No:	HK150424/036	
	Test date:	May 20, 2015	
	Test Requested:	FCC Part 15 – 2012	
	Test Method:	ANSI C63.4 – 2009	
	FCC ID:	V9Q-94130F27	
The results given in this report are related to the tested specimen of the described electrical apparatus.			
CONCLUSION: The submitted sample was found to <u>COMPLY</u> with requirement of FCC Part 15 Subpart C.			
Authorized Signature:			
			
Reviewed by: Keith Yeung		Approved by: Steven Tsang	
Date: May 28, 2015		Date: May 28, 2015	

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This report is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. Our report is limited to the test samples identified herein. The results set forth in this report are not necessarily indicative or representative of the statistical quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof. You shall have thirty days from receipt of this report to request additional testing of the samples or to notify us of any errors or omissions relating to our report, provided, however, such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.



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Test Result Summary

EMISSION TEST			
Test requirement: FCC Part 15 - 2012			
Test Condition	Test Method	Test Result	
		Pass	Failed
Radiated Emission Test, 9kHz to 1GHz	ANSI C63.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Frequency range of Fundamental Emission	ANSI C63.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
26dB Bandwidth of Fundamental Emission	ANSI C63.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Duty Cycle Correction During 100mesc	ANSI C63.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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 C63.4 – 2009. An Open Area Test Site and Full Anechoic Chamber (FCC Listed Site, Registration No. 642151) 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.	CALIBRATION DUE
EMI TEST RECEIVER	R&S	ESCI	100379	03-FEB-2016
SIGNAL ANALYZER 40GHZ	R&S	FSV 40	100977	12-MAY-2016
LOOP ANTENNA	ETS-LINDGREN	6502	00102266	27-SEP-2015
BILOG ANTENNA	SCHAFFNER	CBL6112D	25229	02-FEB-2016
OPEN AREA TEST SITE	BVCPS	N/A	N/A	06-JUL-2015
ANECHOIC CHAMBER	ALBATROSS	M-CDC	80374004499B	04-FEB-2016
COAXIAL CABLE	SUHNER	RG214	N/A	22-DEC-2015

Remarks: -

N/A: Not Applicable or Not Available

Measurement Uncertainty

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	9kHz to 30MHz	4.2dB
	30MHz to 1GHz	5.0dB
	1GHz to 18GHz	4.9dB

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:

Product: 1:16 Scale Assortment – Ford Fiesta RS WRC
 Model No.: 94130(94132)
 Additional Model name: 1: 16 Scale Assortment – Porsche 911 GT3, 2014 Audi R8, VW POLO WRC, MINI Countryman WRC, Citroen DS3 WRC
 1:16 Scale R/R Assortment – Trucks – Ford F-150 SVT Raptor, Trophy Truck, Jeep Rubicon
 Additional Model number: 94130(94131, 94133, 94134, 94135, 94136)
 94150(94151, 94153, 94154)
 Additional Model Information: Declare the Circuit, PCB layout and Electrical parts of the products are identical to the basic model, except the packaging and appearance.
 Power Supply: 4.5Vd.c. (“AAA” size battery x 3)

Description of EUT Operation:

The Equipment Under Test (EUT) is a **TOY STATE INTERNATIONAL LIMITED** of Radio Control toy. It is 1 switch, 1 wheel and 1 trigger the transmitter and operating at 27.145MHz. It includes 3 channels – A, B & C and they are using the same frequency, the difference is the pattern of pulse train. The worst case was tested and the result is shown in the report. The EUT continues to transmit while trigger are being pushed or pulled, Modulation by IC, and type is Amplitude modulation.

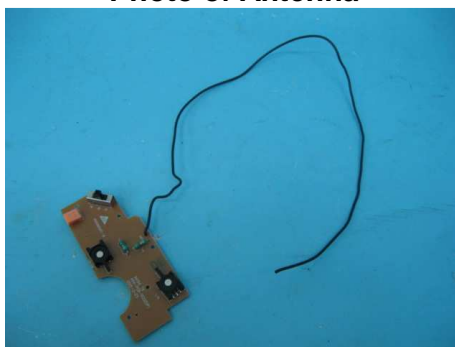
The transmitter has different control:

1. Switch – choose the channel A, B, C
2. Wheel – control left and right
3. Trigger – control forward and backward

Antenna Requirement (Section 15.203)

The EUT is use of a permanently antenna. The antenna consists of 44cm long wire. 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 C63.4
 Test Date(s): 2015-05-20
 Temperature: 25.0 °C
 Humidity: 72.0 %
 Atmospheric Pressure: 100.2 kPa
 Mode of Operation: Transmission mode
 Tested Voltage: 4.5Vd.c. ("AAA" size battery x 3)

Test Method:

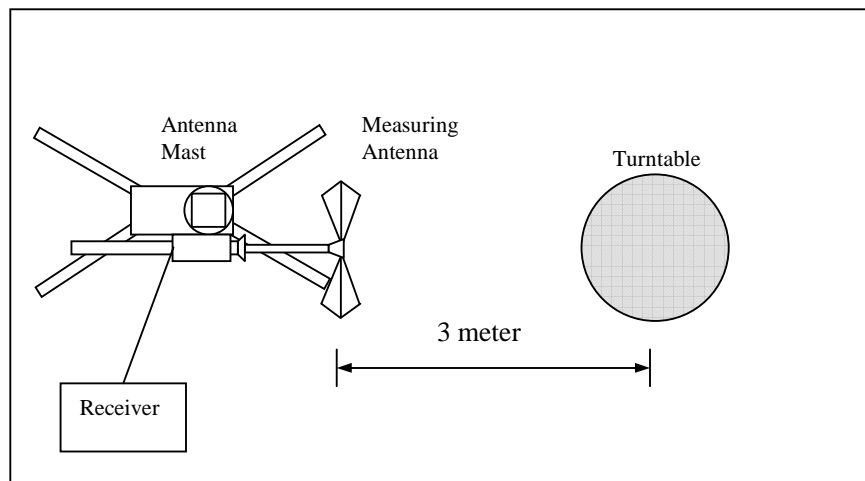
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009.

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

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Peak] [$\mu\text{V/m}$]	Field Strength of Fundamental Emission [Average] [$\mu\text{V/m}$]
26.96 – 27.28	100,000 (100 dB $\mu\text{V/m}$)	10,000 (80 dB $\mu\text{V/m}$)

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 (dB $\mu\text{V/m}$)	Limit at 3m (dB $\mu\text{V/m}$)	Margin (dB)
27.145	V/0°	10.0	74.0	100.0	-26.0

Detection mode: # Average

Frequency (MHz)	Polarity (H/V) and degree	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dB $\mu\text{V/m}$)	Limit at 3m (dB $\mu\text{V/m}$)	Margin (dB)
27.145	V/0°	10.0	**57.0	80.0	-23.0

For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.

**Duty Cycle Correction = $20\text{Log}(0.14) = -17\text{dB}$

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 100KHz
VBW = 300KHz



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Radiated Emissions (9kHz – 1GHz)

Test Requirement: FCC Part 15 Section 15.209
 Test Method: ANSI C63.4
 Test Date(s): 2015-05-20
 Temperature: 25.0 °C
 Humidity: 72.0 %
 Atmospheric Pressure: 100.2 kPa
 Mode of Operation: Transmission mode
 Tested Voltage: 4.5Vd.c. ("AAA" size battery x 3)

Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [$\mu\text{V}/\text{m}$]	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 (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
54.290	H	8.2	29.8	40.0	-10.2
81.435	H	8.0	32.0	40.0	-8.0
108.580	H	13.2	28.3	43.5	-15.2
135.725	H	13.5	26.5	43.5	-17.0
162.870	H	11.0	25.1	43.5	-18.4
190.015	H	10.8	25.2	43.5	-18.3
217.160	H	10.7	26.6	46.0	-19.4
244.305	H	13.3	25.4	46.0	-20.6
271.450	H	14.2	31.0	46.0	-15.0
298.595	H	14.8	29.4	46.0	-16.6

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
54.290	V	8.2	28.0	40.0	-12.0
81.435	V	8.0	31.5	40.0	-8.5
108.580	V	13.2	29.2	43.5	-14.3
135.725	V	13.5	25.5	43.5	-18.0
162.870	V	11.0	24.9	43.5	-18.6
190.015	V	10.8	23.8	43.5	-19.7
217.160	V	10.7	27.0	46.0	-19.0
244.305	V	13.3	25.8	46.0	-20.2
271.450	V	14.2	28.1	46.0	-17.9
298.595	V	14.8	27.1	46.0	-18.9

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz
VBW = 120KHz



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26dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.227
Test Method: ANSI C63.4
Test Date(s): 2015-05-20
Temperature: 25.0 °C
Humidity: 72.0 %
Atmospheric Pressure: 100.3 kPa
Mode of Operation: Transmission mode
Tested Voltage: 4.5Vd.c. ("AAA" size battery x 3)

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]
27.1456	92.16	within 26.96 – 27.28

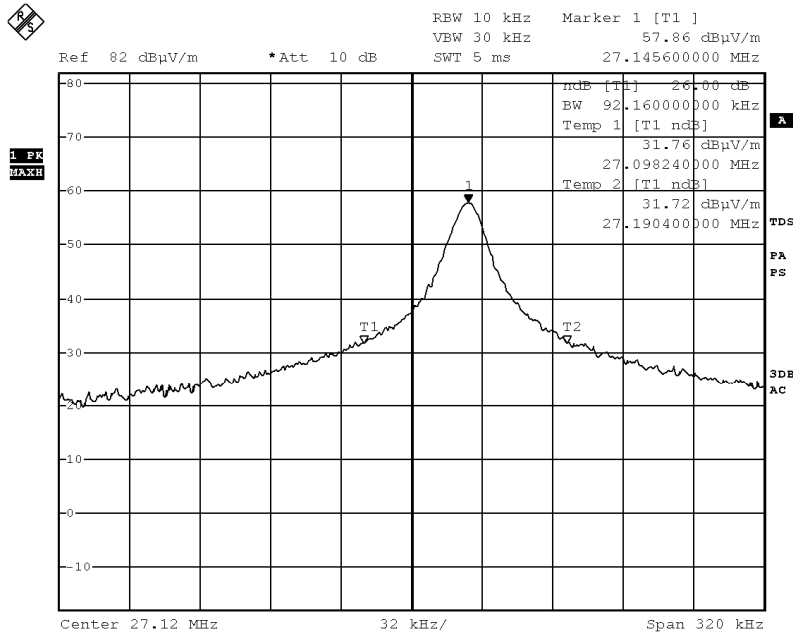


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Measurement Data

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 10 long (0.7msec) and 70 short (0.1msec) pulses. Assuming any combination of short and long pulses maybe obtained due to encoding the worst case transmit duty cycle would be considered $(10 \times 0.7 \text{msec}) + (70 \times 0.1 \text{msec})$ per 100msec = 14% duty cycle. Figure A through C shows the characteristics of the pulse train for one of these functions.

Remarks: -

Duty Cycle Correction = $20 \log(0.14) = -17 \text{dB}$

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 [Long Pulse]

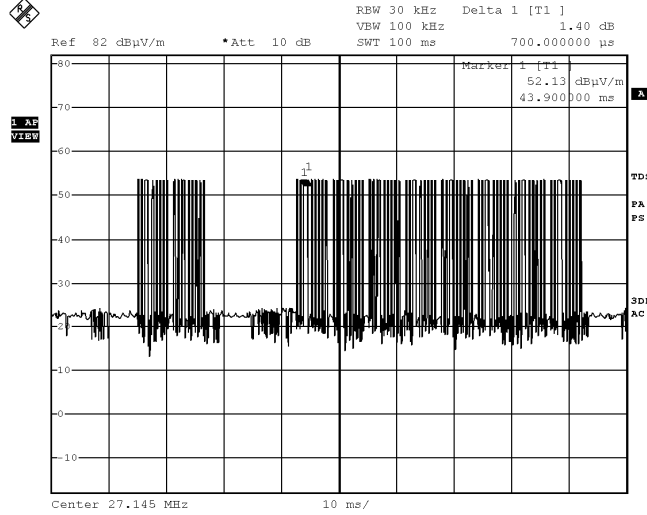
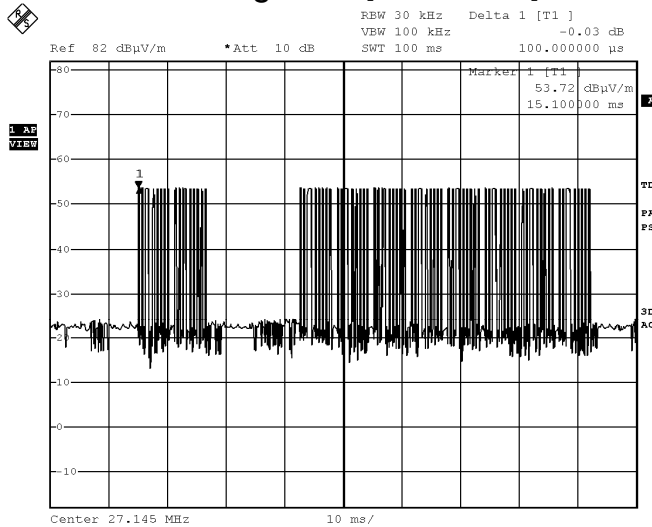


Figure B [Short Pulse]



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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



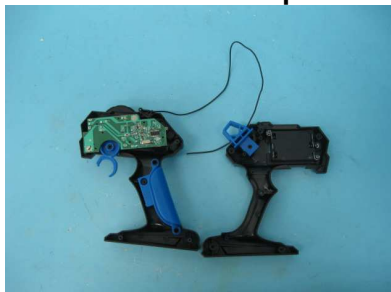
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Photographs of EUT

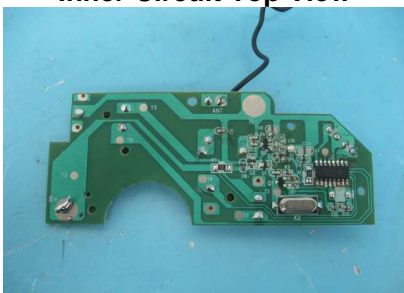
Internal View of the product



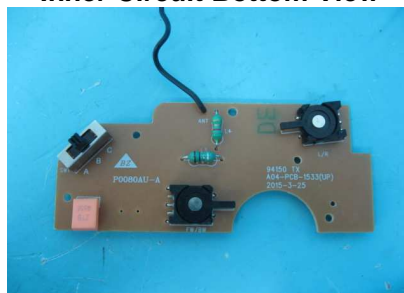
Internal View of the product



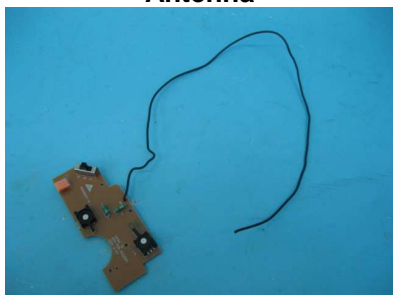
Inner Circuit Top View



Inner Circuit Bottom View

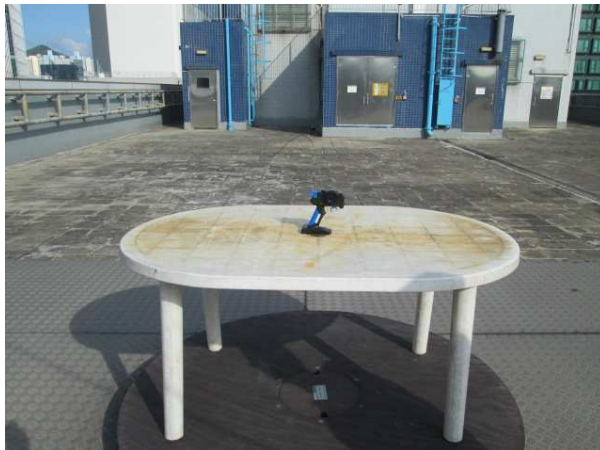


Antenna



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Measurement of Radiated Emission Test Set Up



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