

EMC VERIFICATION SUMMARY

Report No.: SZHH01169038-003

Toy

ITE

Others

Model: D61 Additional Models: See page 2 Product Description: REMOTE CONTROL AIRCRAFT SERIES Sample Receipt Date: 27 June 2017	Applicant: ZHANG BO TOYS FACTORY XIACUN INDUSTRIAL ZONE, LIANXIA TOWN, CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG, CHINA Test Conducted Date: 27 June 2017 to 19 July 2017		
<input checked="" type="checkbox"/> 1st TEST <input type="checkbox"/> 2nd TEST	ALL TESTS WERE CONDUCTED IN ACCORDANCE WITH: *EN 55014-1: 2006 + A1: 2009 + A2: 2011 *EN 55014-2: 2015		
Test Site and Location:	Intertek Testing Services Shenzhen Ltd. Longhua Branch 1F/2F, Building B, QiaoAn Scientific Technology Park, ShangKeng Community, GuanHu Subdistrict, LongHua District, ShenZhen. P.R. China		
Test Result	OK	Not OK	Remark
*EN 55014-1: 2006 + A1: 2009 + A2: 2011	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
*EN 55014-2: 2015	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When determining the test conclusion, the Measurement Uncertainty of test has been considered.			

Prepared and Checked By:

Approved By:

Sign On File
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Assistant Supervisor
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Date: 19 July 2017

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TRF No.: EN55014-1/2_b

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EMC Results Conclusion (with Justification)

RE: EMC Testing Pursuant to EMC Directive 2014/30/EU Performed On the REMOTE CONTROL AIRCRAFT SERIES,
Model: D61

We tested the REMOTE CONTROL AIRCRAFT SERIES, Model: D61 to determine if it was in compliance with the relevant EN standards as marked on the EMC Verification Summary. We found that the unit met the requirement of EN 55014-1, EN55014-2 standards when tested as received.

The additional models: H26,H26WH,CF-906,CF-907,CF-908,CF-909,CF-910,CF-911,CF-912,CF-913,CF-914,CF-915,CF-916,CF-917,CF-918,CF-919,CF-920,CF-921,CF-922,CF-923,CF-924,CF-925,CF-926,CF-927,CF-928,CF-929,CF-930,CF-931,CF-932,CF-933,CF-934,CF-935,CF-936,CF-937,CF-938,CF-939,CF-940,CF-941,CF-942,CF-943,CF-944,CF-945,CF-946,CF-947,CF-948,CF-949,CF-950,CF-951,CF-952,CF-953,CF-954,CF-955,CF-956,CF-957,CF-958,CF-959,D61, D62,D63,D51,D52,D53,D86,D85,D65 are same as the model: D61 in hardware aspect. Theirs difference in the appearance and model number.

The production units are required to conform to the initial sample as received when the units are placed on the market.



LABORATORY MEASUREMENTS**Configuration Information**

Equipment Under Test (EUT):	REMOTE CONTROL AIRCRAFT SERIES
Model:	D61
Serial No.:	Not Labelled
Support Equipment:	Samsung Adapter (Model: AD5055) Input: AC 100V-240V, 50/60Hz, 0.2A; Output: 5V, 0.55A (Provided by Intertek)
Cables & Others:	USB Charge Cable length with 50 Cm, Unshielded (Provided by Client)
Adapter:	N/A
Rating Voltage:	See above



Applicant: ZHANG BO TOYS FACTORY

Model: D61

Worst Case Operating Mode: Charging with adapter

EN 55014-1 Radiated Scan

Used Test Equipment

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ185-01	EMI Receiver	R & S	ESCI	9-Feb-17	9-Feb-18
SZ061-12	Biconilog Antenna	ETS	3142E	9-Sep-16	9-Sep-17
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	16-Jan-17	16-Jan-19

- Notes:
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (–) in the margin column signify levels below the limit
 3. Frequency range scanned: 30MHz to 1000MHz.
 4. Only emissions significantly above equipment noise floor are reported.
 5. Uncertainty: $\pm 4.8\text{dB}$ at a level of confidence of 95%.



Applicant: ZHANG BO TOYS FACTORY

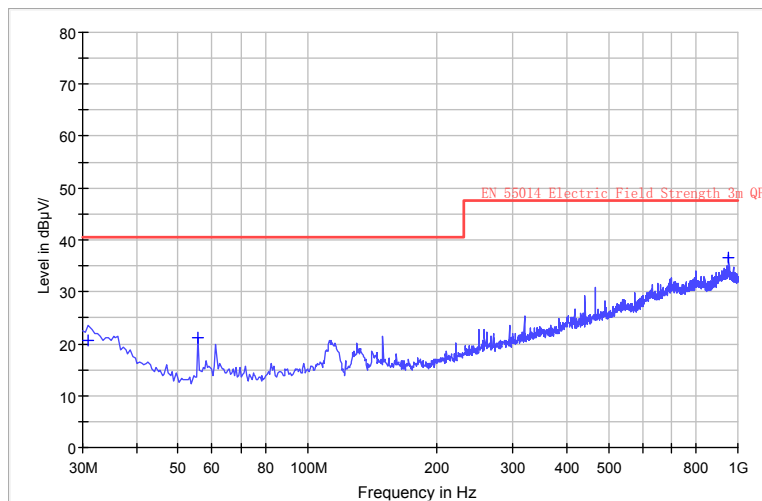
Model: D61

Worst Case Operating Mode: Charging with adapter

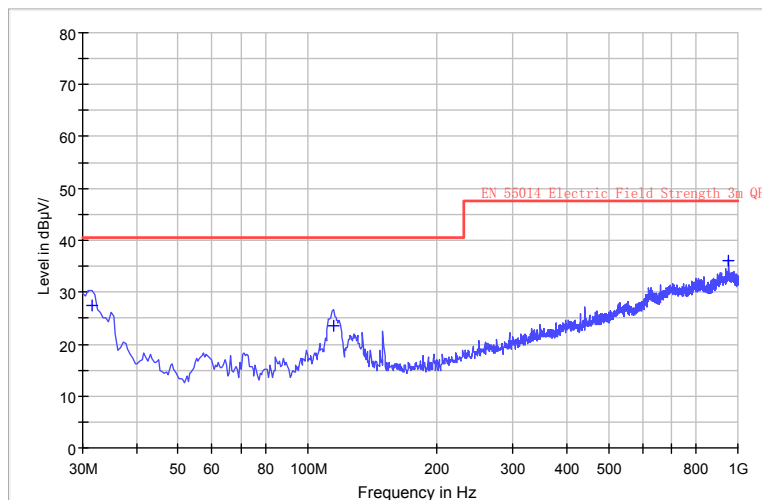
Graphic

Radiated Emissions Pursuant to EN55014-1: Emissions Requirement

Horizontal



Vertical



Applicant: ZHANG BO TOYS FACTORY

Model: D61

Worst Case Operating Mode: Charging with adapter

Data Table

Radiated Emissions Pursuant to EN55014-1: Emissions Requirement

Polarization	Frequency (MHz)	Net at 3m (dB μ V/m)	Calculated Net at 10m (dB μ V/m)	Limit at 10m (dB μ V/m)	Margin (dB)
H	30.970	21.2	10.7	30.0	-19.3
H	55.705	21.2	10.7	30.0	-19.3
H	952.955	36.0	25.5	37.0	-11.5
V	31.455	27.5	17.0	30.0	-13.0
V	114.875	23.5	13.0	30.0	-17.0
V	953.440	36.0	25.5	37.0	-11.5

No emissions significantly above equipment noise floor.



EN 55014-1 RFI Voltage Test

Used Test Equipment

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ185-02	EMI Receiver	R & S	ESCI	01-Nov-2016	01-Nov-2017
SZ187-01	LISN	R & S	ENV216	01-Nov-2016	01-Nov-2017
SZ188-03	Shielding Room	ETS	RFD-100	16-Jan-2017	16-Jan-2019

- Notes:
1. Peak and average detector quick scan are showed on the graph and final quasi-peak and average detector data are measured, the worst-case is recorded in the following graph and table.
 2. Frequency range scanned: 150kHz to 30MHz.
 3. Only emissions significantly above equipment noise floor are reported.
 4. Uncertainty: $\pm 3.6\text{dB}$ at a level of confidence of 95%.



Applicant: ZHANG BO TOYS FACTORY

Model: D61

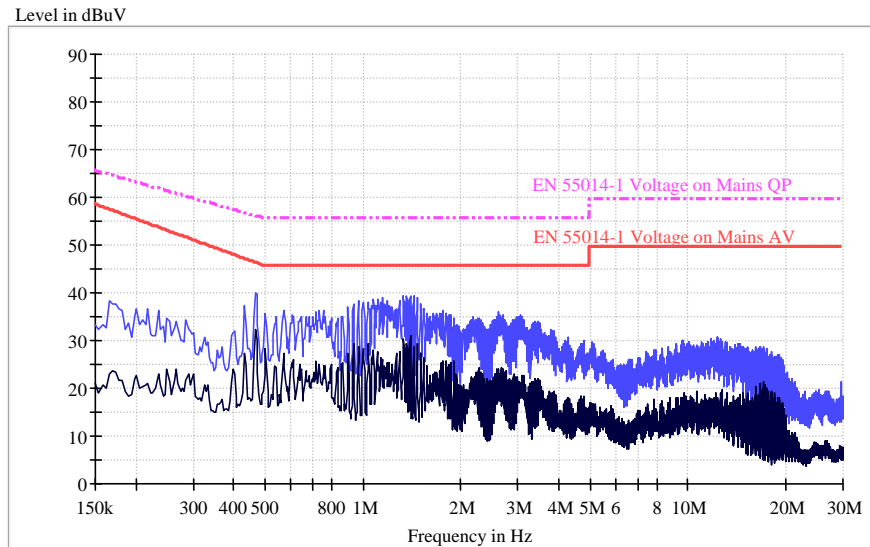
Worst Case Operating Mode: Charging with adapter

Phase: Live / Neutral

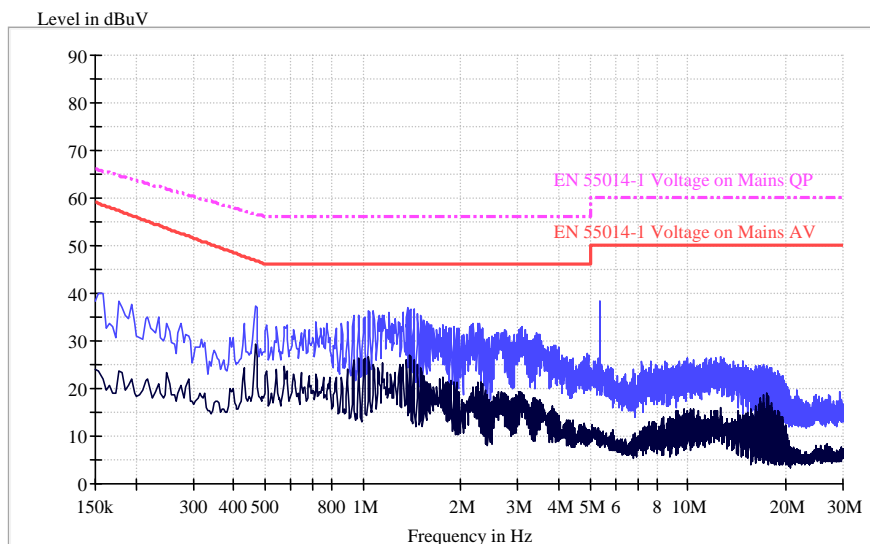
Graphic

RFI Voltage Test Pursuant to EN 55014-1: Emissions Requirement

Live Line



Neutral Line



Applicant: ZHANG BO TOYS FACTORY

Model: D61

Worst Case Operating Mode: Charging with adapter

Phase: Live / Neutral

Data Table

RFI Voltage Test Pursuant to EN 55014-1: Emissions Requirement

Live Line

Frequency (MHz)	Quasi-Peak		Average	
	Disturbance level dB(μV)	Permitted limit dB(μV)	Disturbance level dB(μV)	Permitted limit dB(μV)
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No emissions significantly above equipment noise floor.

Neutral Line

Frequency (MHz)	Quasi-Peak		Average	
	Disturbance level dB(μV)	Permitted limit dB(μV)	Disturbance level dB(μV)	Permitted limit dB(μV)
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No emissions significantly above equipment noise floor.



EN 61000-4-2 Electrostatic Discharge

Test Summary (Pursuant to EN55014-2)

Basic Standard:		IEC 61000-4-2: 1995 + A1: 1998 + A2: 2000
Port:		Enclosure
Required Performance Criterion:		B
Level:		±8.0 kV (Air Discharge) ±4.0 kV (Contact Discharge) ±4.0 kV (Indirect Contact Discharge)
Time Between Each Discharge:		1 second
Test Mode:		Charging with adapter
Temperature:		25.3°C
Humidity:		47.4%
Test Setup:		Table-top
Test of Post-installation		N/A
Test Point:	Air Discharge:	All insulated enclosure and seams
		All the points where contact discharge cannot be applied
	Contact:	All metal parts of the EUT
	HCP:	All sides of the EUT
	VCP:	Four faces of the EUT

Used Test Equipment

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ189-03	ESD Simulator	TESEQ	NSG 435	17-Nov-2016	17-Nov-2017



Test Results

EN 61000-4-2 Electrostatic Discharge

Discharge Type	No. of Discharge	Applied Voltage	Result (Pursuant to EN 55014-2, Criterion B)
Contact Discharge	20	+4kV	OK
		-4kV	OK
Air Discharge	20	+8kV	OK
		-8kV	OK
Indirect HCP Discharge	20	+4kV	OK
		-4kV	OK
Indirect VCP Discharge	20	+4kV	OK
		-4kV	OK

Additional Information

No observable change



**EN61000-4-4
Electrical Fast Transient / Burst**

Test Summary (Pursuant to EN55014-2)

Basic Standard:	IEC 61000-4-4: 2004	
Port:	AC Power Lines	DC Power Lines, Signal Lines and Control Lines
Required Performance Criterion:	B	
Limit:	±1.0kV	±0.5kV
Test Duration:	1 minute	
Temperature:	24°C	
Relative Humidity:	53%	
Test Mode:	Charging with adapter	
Test Setup:	Table-top	
Generator Drive:	Internal	
Sequence of Application:	Multiple	

Used Test Equipment

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ063-01	Compact Immunity Tester	Haefely	ECOMPACT 4	09-Feb-2017	09-Feb-2018



Applicant: ZHANG BO TOYS FACTORY
Model: D61

Test Results

EN61000-4-4 Electrical Fast Transient / Burst

Port	Level	Polarity	Result (Pursuant to EN55014-2, Criterion B)
AC Power Lines	1kV	+	OK
	1kV	-	OK
DC Power Lines	0.5kV	+	N/A
	0.5kV	-	N/A
Signal Lines	0.5kV	+	N/A
	0.5kV	-	N/A
Control Lines	0.5kV	+	N/A
	0.5kV	-	N/A

- Additional Information
- No observable change



EN61000-4-5 Surge Immunity

Test Summary (Pursuant to EN55014-2)

Basic Standard:	IEC 61000-4-5: 2005		
Port:	AC Power Lines		
	Phase and Neutral	Phase and Earth	Neutral and Earth
Limit:	5 Positive and 5 Negative Surges		
	±1kV	±2kV	±2kV
Generator Impedance:	2ohm	12ohm	12ohm
Required Performance Criterion:	B		
Repetition Rate:	1 minute		
Temperature:	26.4°C		
Relative Humidity:	64.2%		
Test Mode:	Charging with adapter		
Test Setup:	Table-top		
Surge Generator Trigger:	Internal		
Installation Condition:	Class 3: Electrical environment where cables run in parallel.		
Phase Angle:	90°, 270°		

Used Test Equipment

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ063-01	Compact Immunity Tester	Haefely	ECOMPACT 4	09-Feb-2017	09-Feb-2018



Test Results

EN61000-4-5 Surge Immunity

Level	Result (Pursuant to EN55014-2, Criterion B)
Between Phase and Neutral: $\pm 1\text{kV}$	OK
Between Phase and Earth: $\pm 2\text{kV}$	N/A
Between Neutral and Earth: $\pm 2\text{kV}$	N/A

- Additional Information
- No observable change



**EN61000-4-6
Injected Current (0.15MHz to 230MHz)**

Test Summary (Pursuant to EN55014-2)

Basic Standard:	IEC 61000-4-6: 2003 + A1: 2004 + A2: 2006
Port:	AC Power Lines, DC Power Lines, Signal Lines and Control Lines
Required Performance Criterion:	A
Limit:	3.0V (rms)
Test Modulation:	1kHz, 80% AM
Frequency:	0.15MHz to 230MHz
Dwell Time:	1s
Frequency Step:	1%
Temperature:	24°C
Relative Humidity:	53%
Coupling Factor of CDN:	-1.0dB ~ -1.7dB
Test Mode:	Charging with adapter
Test Setup:	Table-top
Equipment Under Test (EUT):	Single Unit

Used Test Equipment

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ180-02	Signal Generator	Aeroflex	2023A	09-Feb-2017	09-Feb-2018
SZ181-03	Amplifier	AR-WORLDWIDE	75A250	09-Feb-2017	09-Feb-2018
SZ181-03-01	Attenuator	AR-WORLDWIDE	6dB/50FH-006-100	09-Feb-2017	09-Feb-2018
SZ183-01	RF CURRENT-INJECTION CLAMP	LUTHI	EM101	09-Feb-2017	09-Feb-2018
SZ184-01	Coupling-Decoupling Network	LUTHI	CDN L-801 M2/M3	09-Feb-2017	09-Feb-2018



Test Results

EN61000-4-6

Injected Current (0.15MHz to 230MHz)

Port	Frequency (MHz)	Level	Result (Pursuant to EN55014-2, Criterion A)
AC Power Lines	0.15 to 230	3V (rms)	OK
DC Power Lines	0.15 to 230	1V (rms)	N/A
Signal Lines	0.15 to 230	1V (rms)	N/A
Control Lines	0.15 to 230	1V (rms)	N/A

Additional Information

No observable change



EN61000-4-11 Voltage Dips and Interruptions

Test Summary (Pursuant to EN55014-2)

Basic Standard	EN 61000-4-11: 2004			
Port:	A.C. Power Lines			
Limit:	Test level in %UT	Duration (Periods)		Required Performance Criterion
		50Hz	60Hz	
	0	0.5	0.5	C
	40	10	12	C
	70	25	30	C
No. of dips/interruptions:	3			
Test Mode:	Charging with adapter			
Test Setup:	Test generator causes the interference of the EUT AC mains			

U_T is the rated voltage for the equipment.

Used Test Equipment

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ063-01	Compact Immunity Tester	Haefely	ECOMPACT 4	09-Feb-2017	09-Feb-2018



Test Results

EN61000-4-11 Voltage Dips and Interruptions

Test condition			Result (Pursuant to EN55014-2, Criterion C)
Test Level in %UT	Duration (Periods)		
	50Hz	60Hz	
0	0.5	0.5	OK
40	10	12	OK
70	25	30	OK

Additional Information

No observable change



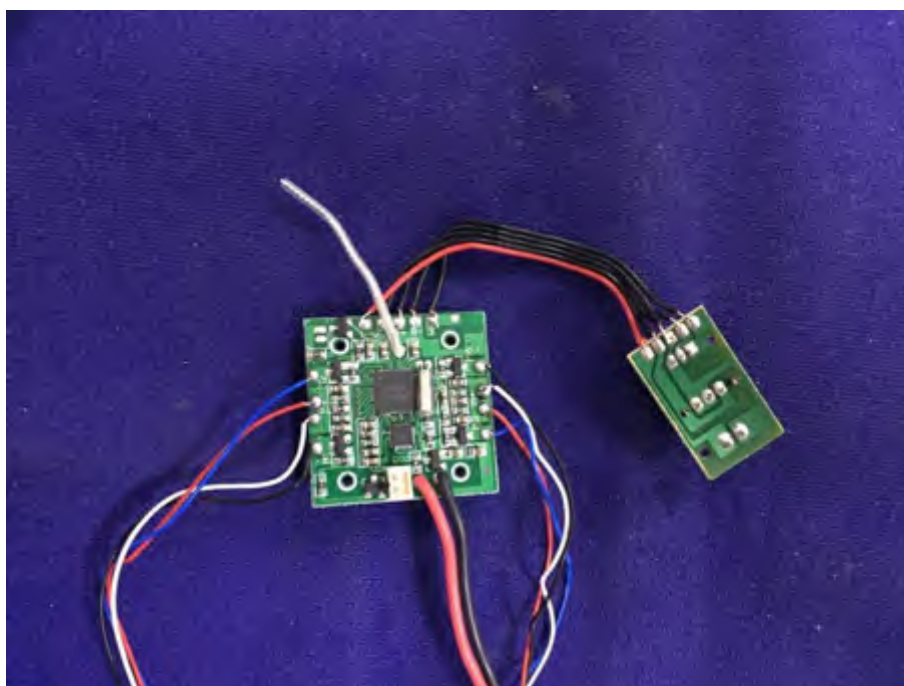
External Photo



Internal Photo (RX)



Internal Photo (RX)



Internal Photo (RX)



Internal Photo (USB Charging Cable)



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