

MAY CHEONG TOY PRODUCTS FTY., LTD

TEST REPORT

SCOPE OF WORK

RAIDO FREQUENCY AND EMC TESTING-81200(13092/11011)

REPORT NUMBER

SZHH01243821-001S1

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Intertek Report No. : SZHH01243821-001S1

RADIO COMMUNICATIONS AND EMC TESTING REPORT

MAY CHEONG TOY PRODUCTS FTY., LTD

Model: 81200(13092/11011)

Additional Models: 81202(12051/12118) ;

82052/82072(82067/82068/82069/82071) ;

82040(82041/82042) ; 81074/81084/81143 ; 81200(11011/11012/11017) ;

81127 ; 81100(81092/81095/81096/81098)

1/14 Express Lane RC

Additional Names: Radio Control Vehicle Light Runners R/C, Asst. ; 1:16 Off-Road RC, Asst. ; 1:16 Off-Road RC in open touch box (w/pistol grip controller) ; 1:16 Harley-Davidson R/C asst. ; Radio Control Vehicle 1:24

Formula R/C - Ferrari F138 ; Radio Control Vehicle 1:18 R/C Red Bull

Racing RB9 ; Radio Control Vehicle 1:24 R/C Red Bull Racing RB9 ; 1/14

Express Lane RC ; 1:16 R/C Recon Rover ; 1:16 Off-Road R/C, Assorted

Test Report No. : SZHH01243821-001S1

Remark: This report base on the previous report with report No. SZHH01243821-001 dated 16 May 2018. Only update model number, don't test after engineer evaluate.

Test Engineer :	Terry Tang Senior Engineer	Sign On File
Report Approved By :	Jimmy Wen Supervisor	
Date :	25 May 2018	

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**RADIO PERFORMANCE MEASUREMENTS
RESULT SUMMARY**

Requirements	ETSI EN 300 220-2	ETSI EN 300 220-1	Compliance
	Clause Number		
Unwanted emissions in the spurious domain (Receiver Portion)	4.2.2	5.9.1	Complied
Blocking	4.4.2	5.18.1	Complied
When determining of the test conclusion, the Measurement Uncertainty of test has been considered.			

**EMC COMPLIANCE MEASUREMENTS
RESULT SUMMARY**

	ETSI EN 301 489-3	ETSI EN 301 489-1	Compliance
	Clause Number		
EMC Emission	7.2	8.2	Complied
Electrostatic Discharge	7.3	9.3	Complied
Radio Frequency Electromagnetic Field (80MHz-6GHz)	7.3	9.2	Complied

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

EQUIPMENT UNDER TEST (EUT) INFORMATION

Applicant: MAY CHEONG TOY PRODUCTS FTY., LTD
UNIT 901-2, 9/F., EAST OCEAN CENTRE, 98 GRANVILLE ROAD,
TSIMSHATSUI EAST, KOWLOON, HONG KONG

Description of EUT : 1/14 Express Lane RC

Brand Name(s) / Type Number(s) : N/A / 81200(13092/11011)

Serial Number(s) : Not Labelled

Equipment Received : 16 April 2018

Test Date(s) : 16 April 2018 to 16 May 2018

Type of EUT : RC Toys

Receiver category of EUT : Class 3 Type III Equipment

Temperature Category of EUT: Category I: -20°C to +55°C

Type of Modulation: Pulse Modulation

Test Specification(s) : ETSI EN 300 220-2: V3.1.1 (2017-02)
ETSI EN 300 220-1: V3.1.1 (2017-02)
Draft ETSI EN 301 489-1 V2.2.0 (2017-03)
Final Draft ETSI EN 301 489-3 V2.1.1 (2017-03)

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EXHIBIT 1

GENERAL DESCRIPTION

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1 INTRODUCTION

Intertek Testing Services Shenzhen Limited Longhua Branch (address: 1F/2F, Building B, QiaoAn Scientific Technology Park, ShangKeng Community, GuanHu Subdistrict, LongHua District, ShenZhen. P.R. China, 518110) has tested the MAY CHEONG TOY PRODUCTS FTY., LTD, 1/14 Express Lane RC, 81200(13092/11011). The sample was tested to the relevant performance specification published by the European Telecommunications Standards Institute. This report contains the results of these tests and is submitted MAY CHEONG TOY PRODUCTS FTY., LTD as the final test results.

The Additional Models: 81202(12051/12118); 82052/82072(82067/82068/82069/82071); 82040(82041/82042); 81074/81084/81143; 81200(11011/11012/11017); 81127; 81100 (81092/81095/81096/81098) are the same as the Model: 81200(13092/11011) in hardware aspect except the different appearance. The difference in model number serves as marketing strategy.

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

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2 TEST SPECIFICATION

2.1 RELEVANT PERFORMANCE SPECIFICATION

The relevant performance specifications for MAY CHEONG TOY PRODUCTS FTY., LTD, 1/14 Express Lane RC, 81200(13092/11011) are the harmonised standard is ETSI EN 300 220-2 V3.1.1 (2017-02) and the technical standards are ETSI EN300 220-1 V3.1.1 (2017-02), Final Draft ETSI EN301 489-3 V2.1.1 (2017-03) and Draft ETSI EN301 489-1 V2.2.0 (2017-03).

The tests performed are those required to demonstrate compliance with the essential requirements of Article 3.1(b) and 3.2 of the Radio Equipment Directive - RED for regulatory purposes.

2.2 TEST ENVIRONMENT

The tests were performed in the Radio communications and Electromagnetic Compatibility Test Facility at Intertek Testing Services Shenzhen Limited Longhua Branch (CNAS No.: L0327). The sample was subjected to the ambient conditions in the laboratory and indoor test site except during tests at extremes of temperatures and the Radiated Emissions Tests. The temperature and relative humidity recorded during the period of each test are given in the results.

2.3 CONFIGURATION OF TEST SAMPLE

The test sample is one receiver.

2.4 TEST POWER SOURCES

The sample of receiver is intended to operate from battery DC 9.0V (6 x 1.5V AA batteries).

2.5 TEST FREQUENCIES

The nominal operating frequency 27.145 MHz at DC 9.0V (6 x 1.5V AA batteries).

2.6 MEASUREMENT UNCERTAINTY

All measurement uncertainties stated in this report are estimated to a 95% confidence level.

2.7 SUPPORT EQUIPMENT – RADIO PERFORMANCE MEASUREMENTS

N/A

2.8 SUPPORT EQUIPMENT – EMC COMPLIANCE MEASUREMENTS

The transmitter model number: #13092 (Provided by client)

EXHIBIT 2

**TEST RESULT
OF
RADIO PERFORMANCE MEASUREMENTS**

TEST REPORT

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3 SPURIOUS EMISSIONS

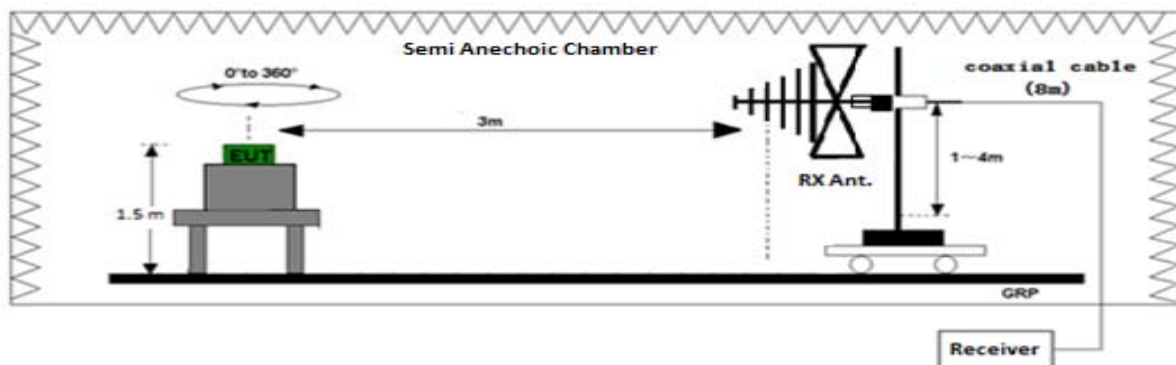
3.1 TEST METHOD AND SUMMARY

Spurious Emissions	
Basic Standard :	ETSI EN 300 220-2 V3.1.1 (2017-02)
Clause :	4.2.2
Application :	All Receivers

3.2 EQUIPMENT LIST

Equipment No.	Equipment	Manufacturer	Model No.	Calibration Date	Next Calibration Due Date
SZ185-01	EMI Receiver	R&S	ESCI	24-Jan-18	24-Jan-19
SZ056-03	Spectrum Analyzer	R&S	FSP	1-Jun-17	1-Jun-18
SZ061-13	BiConiLog Antenna	ETS	3142E	26-Jan-18	26-Jan-19
SZ061-08	Double-Ridged Waveguide Horn Antenna	ETS	3115	20-Sep-17	20-Sep-18
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	26-May-17	26-May-18
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	16-Jan-17	16-Jan-19
SZ180-04	AM/FM Stereo Signal Generator	LEADER	LG 3236	24-Jan-18	24-Jan-19
SZ062-02	RF Cable	RG 213U	N/A	6-Jan-18	6-Jul-18
SZ062-05	RF Cable	0.04-26.5GHz	N/A	6-Jan-18	6-Jul-18

3.3 Test Setup



Test set-up of radiated disturbance (30MHz-1GHz)

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3.4 TEST RESULT – SPURIOUS EMISSIONS (RECEIVER PORTION)

3.4.1 CONDUCTED

Not applicable. Equipment has integral antenna.

3.4.2 RADIATED

3.4.2.1 SPURIOUS EMISSIONS – OPERATING

Test Conditions: Temperature 25.0°C; Humidity 50.0%).

Polarization	Frequency (MHz)	ERP at 3m (dBm)	ERP Limit at 3m (dBm)	Margin (dB)
H	26.8745	-61.5	-57.0	-4.5
H	28.1745	-62.6	-57.0	-5.6
H	29.3345	-63.1	-57.0	-6.1
V	26.8145	-61.5	-57.0	-4.5
V	28.3145	-62.8	-57.0	-5.8
V	30.4345	-62.1	-57.0	-5.1

No emissions significantly above equipment noise floor.

Notes:

1. Negative sign (-) in the margin column signify levels below the limit.
2. Other emissions found were at least 10 dB below the limit.
3. -57 dBm corresponds to 2 nW.
4. -47 dBm corresponds to 20 nW.
5. Measurement uncertainty is ± 4.8 dB at a level of confidence of 95%.

3.4.2.2 SPURIOUS EMISSIONS –STANDBY

No Test Result.

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4 BLOCKING

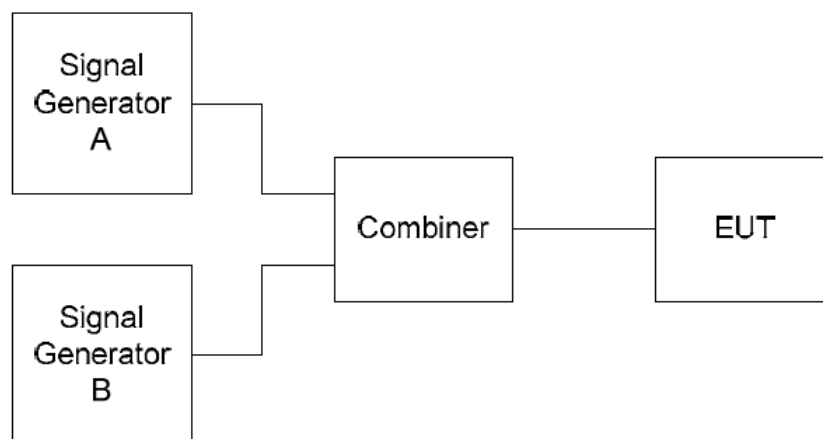
4.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 220-2 V3.1.1 (2017-02)
Clause :	4.4.2
Application :	All category of receiver

4.2 EQUIPMENT LIST

Equipment No.	Equipment	Manufacturer	Model No.	Calibration Date	Next Calibration Due Date
SZ056-03	Spectrum Analyzer	R&S	FSP	1-Jun-17	1-Jun-18
SZ070-16	Combiner	Mini-Circuits	ZFSC-2-2500-S+	30-Oct-17	30-Oct-18
SZ180-01	Signal Generator	R&S	SML03	1-Jun-17	1-Jun-18
SZ180-02	Signal Generator	Aeroflex	2023A	24-Jan-18	24-Jan-19
SZ070-18	Adjust Attenuator	Agilent	8495B & 8494B	28-Dec-17	28-Dec-18
SZ006-06	DC Power Supply	Guwei	GPR-6030D	2-Mar-18	2-Sep-18
SZ068-01	Acoustical Shielded Case	R/S	AF-BOX	6-Jan-18	6-Jul-18
SZ062-14	RF cable	Tek	Torc080	6-Jan-18	6-Jul-18

4.3 TEST SETUP



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4.4 TEST RESULT

Test Conditions: Temperature 25.0°C; Humidity 50.0%

Power level of Signal Generator A = -56.0dBm

Test Frequency offset (MHz) (Centre Frequency: <u>27.145MHz</u>)		Unwanted Emission Power Level Signal B (dBm)	Limit (For Receiver Category 3)	Result
OC Egde +/-2MHz	Lower: 25.145	-37.0	-80 dBm	Complied
	Upper: 29.145	-36.0		Complied
OC Egde +/-10MHz	Lower: 17.145	-29.0	-60 dBm	Complied
	Upper: 37.145	-28.0		Complied
MAX (+/-5% of F _{Centre} or +/- 15 MHz)	Lower: 12.145	-20.0	-60 dBm	Complied
	Upper: 42.145	-20.0		Complied

Note:

1. Measurement uncertainty is ± 4.8 dB at a level of confidence of 95%.

EXHIBIT 3

**TEST RESULT
OF
EMC COMPLIANCE MEASUREMENTS**

5 EMC EMISSION TEST

5.1 TEST METHOD AND SUMMARY

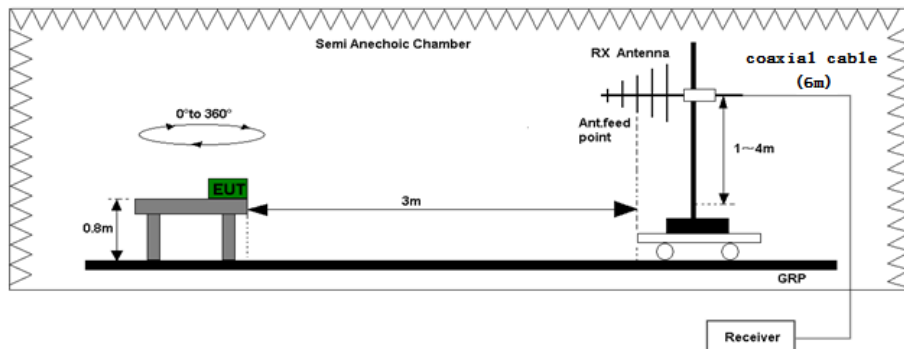
Basic Standard :	EN55032: 2015
Test :	Radiated Emission
Classification :	Class B
Port :	Enclosure Port of Ancillary Equipment

5.2 RADIATED EMISSION TEST

5.2.1 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Calibration Date	Next Calibration Due Date
SZ185-01	EMI Receiver	R&S	ESCI	24-Jan-18	24-Jan-19
SZ056-03	Spectrum Analyzer	R&S	FSP	1-Jun-17	1-Jun-18
SZ061-13	BiConiLog Antenna	ETS	3142E	26-Jan-18	26-Jan-19
SZ061-08	Double-Ridged Waveguide Horn Antenna	ETS	3115	20-Sep-17	20-Sep-18
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	16-Jan-17	16-Jan-19
SZ062-02	RF Cable	RG 213U	N/A	6-Jan-18	6-Jul-18
SZ062-05	RF Cable	0.04-26.5GHz	N/A	6-Jan-18	6-Jul-18

5.2.2 TEST SETUP



Test set-up of radiated disturbance (30MHz-1GHz)

5.2.3 TEST RESULT

Worst-case Operating Mode: Running (Motor)

Polarization	Frequency (MHz)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	54.250	24.7	40.0	-15.3
H	301.600	38.9	47.0	-8.1
H	305.480	37.4	47.0	-9.6
H	364.650	32.9	47.0	-14.1
H	690.570	33.6	47.0	-13.4
H	897.180	34.2	47.0	-12.8
V	54.250	23.7	40.0	-16.3
V	108.085	20.7	40.0	-19.3
V	401.025	25.7	47.0	-21.3
V	630.915	30.8	47.0	-16.2
V	826.370	33.2	47.0	-13.8
V	897.180	34.1	47.0	-12.9

No emissions significantly above equipment noise floor.

Notes:

1. Quasi-Peak Detector Data
2. Negative sign (-) in the margin column signify levels below the limit
3. Frequency range scanned: 30 MHz to 1000 MHz
4. Only emissions significantly above equipment noise floor are reported
5. Measurement Uncertainty: ± 4.8 dB.

5.2.4 MEASUREMENT UNCERTAINTY

Measurement Uncertainties: ± 4.8 dB. The measured result is above the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance is more probable than non-compliance with the specification limit.

6 ELECTROSTATIC DISCHARGE

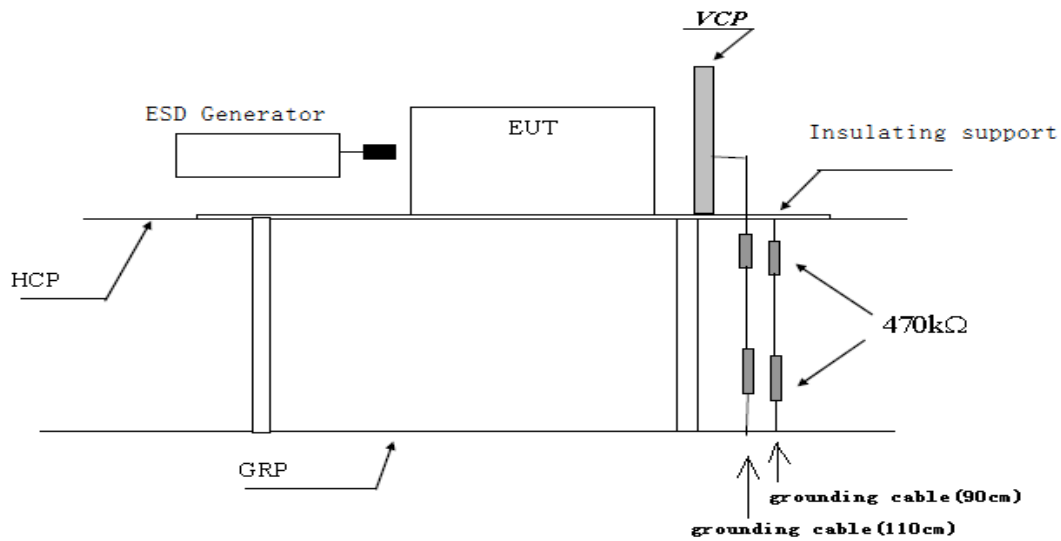
6.1 TEST METHOD AND SUMMARY

Basic Standard :		EN 61000-4-2: 2009
Port :		Enclosure
Required Performance Criterion :		TT & TR
Level :		± 2.0, ± 4.0, ±8.0 kV (Air Discharge) ± 2.0, ±4.0 kV (Contact Discharge) ± 2.0, ±4.0 kV (Indirect Contact Discharge)
No. of Discharge(s) :		Minimum of 10 Discharges per Each Polarity
Time Between Each Discharge :		1 second
Test Mode :		RX : Stand-by and Operating (Motor), Power off
Test Setup :		Table-top
Temperature :		23.0 ⁰ C
Relative Humidity :		55.0%
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 conductive surfaces of the EUT
	HCP:	All sides of the EUT
	VCP:	Four faces of the EUT

6.2 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ189-03	ESD Simulator	Teseq	NSG 435	15-Nov-17	15-Nov-18

6.3 TEST SETUP



Test set-up of electrostatic discharge

6.4 TEST RESULT

6.4.1 TEST RESULT

Discharge Type	Applied Voltage	Result (Pursuant to ETSI EN 301 489-3 Criterion TR)
Contact Discharge	$\pm 2.0, \pm 4\text{kV}$	Complied
Air Discharge	$\pm 2, \pm 4, \pm 8\text{kV}$	Complied
Indirect HCP Discharge	$\pm 2.0, \pm 4\text{kV}$	Complied
Indirect VCP Discharge	$\pm 2.0, \pm 4\text{kV}$	Complied

6.4.2 ADDITIONAL RESULT INFORMATION

No observable change.

7 RADIO FREQUENCY ELECTROMAGNETIC FIELD

7.1 TEST METHOD AND SUMMARY

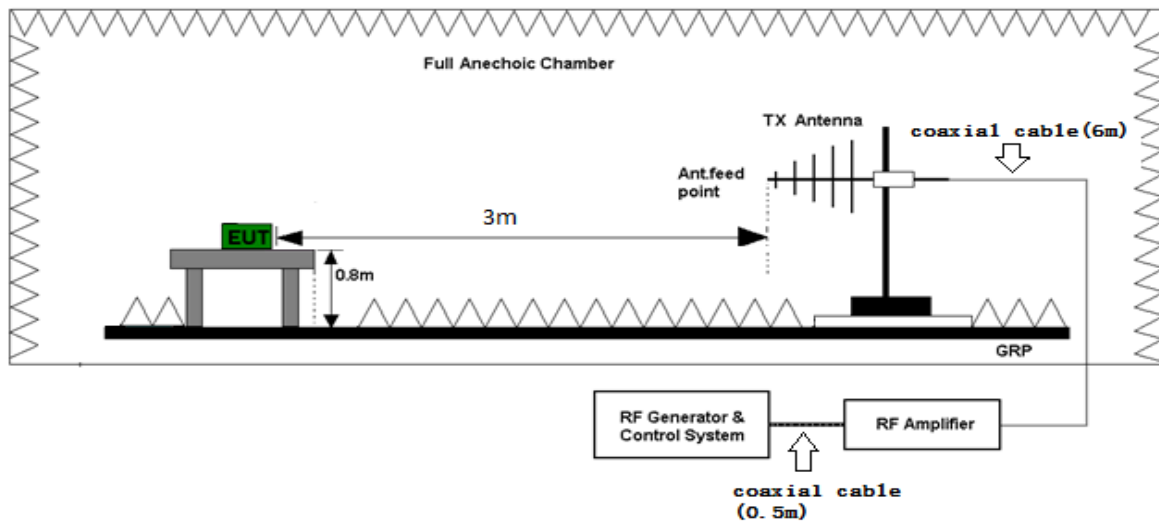
Basic Standard :	EN 61000-4-3: 2006 + A1: 2008 + A2: 2010
Port :	Enclosure
Required Performance Criterion :	CT & CR
Level :	3.0 V/m (rms)
Test Modulation :	1kHz, 80% AM
Frequency :	80 MHz to 6000 MHz
Dwell Time :	1s
Frequency Step :	10%
Temperature :	25.3 ⁰ C
Relative Humidity :	47.7%
Test Facility :	Full Anechoic Chamber
Antenna Polarization :	Horizontal and Vertical
Type of Antenna :	Broadband Antenna
Test Distance :	3m
Test Mode :	RX : Stand-by and Operating (Motor), Power off
Test Setup :	Table-top

7.2 TEST EQUIPMENT

* The Equipment would be verified together with the test system before testing.

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ061-04	BiConiLog Antenna	ETS	3142C	17-Oct-17	17-Oct-18
EM061-06	Stacked double log-Per. Antenna	SCHWARZBEC K	STLP 9149	10-Nov-17	10-Nov-18
SZ180-01	Signal Generator	R&S	SML03	1-Jun-17	1-Jun-18
SZ180-15	Signal Generator	R&S	SMB 100A	15-Nov-17	15-Nov-18
SZ181-01	Amplifier	PRANA	AP32 MT215	24-Jan-18	24-Jan-19
SZ181-02	Power Amplifier	MILMEGA	AS0825-35	23-May-17	23-May-18
SZ190-07	RF Amplifier	AMETEK	AS0860-75/45	24-Jan-18	24-Jan-19
SZ182-01	RF Power Meter	BOONTON	4232A	24-Jan-18	24-Jan-19
SZ188-02	Anechoic Chamber	ETS	RFD-F/A-100	16-Jan-17	16-Jan-19
SZ062-02	RF Cable	RADIALL	RG 213U(6M)	6-Jan-18	6-Jul-18
SZ186-01	Field Probe	ETS	HI-6105	31-Mar-18	31-Mar-19
SZ070-05	Directional Coupler	Agilent	87300C	28-Dec-17	28-Dec-18

7.3 TEST SETUP



Test set-up of Immunity to Radiated Electric Fields

7.4 TEST RESULT

7.4.1 TEST RESULT

Frequency (MHz)	Exposed Side	Result (Pursuant to ETSI EN 301 489-3 Criterion CT & CR)
80 to 6000	Front	Complied
80 to 6000	Left	Complied
80 to 6000	Rear	Complied
80 to 6000	Right	Complied

7.4.2 ADDITIONAL RESULT INFORMATION

No observable change.

EXHIBIT 4

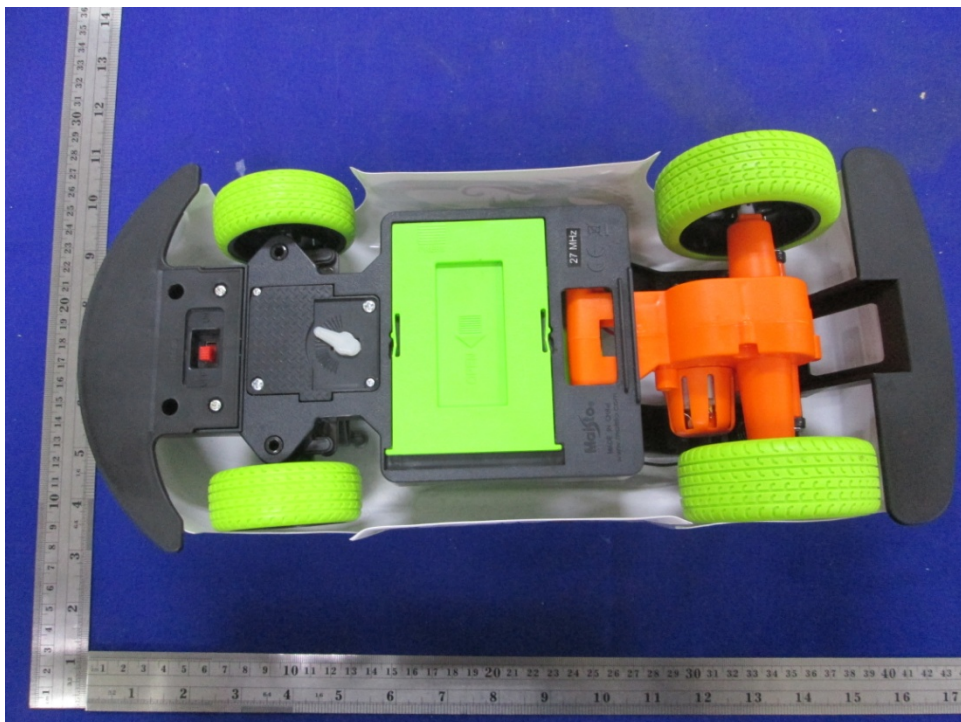
PHOTOS OF EUT

8 EUT PHOTOS

External Photo



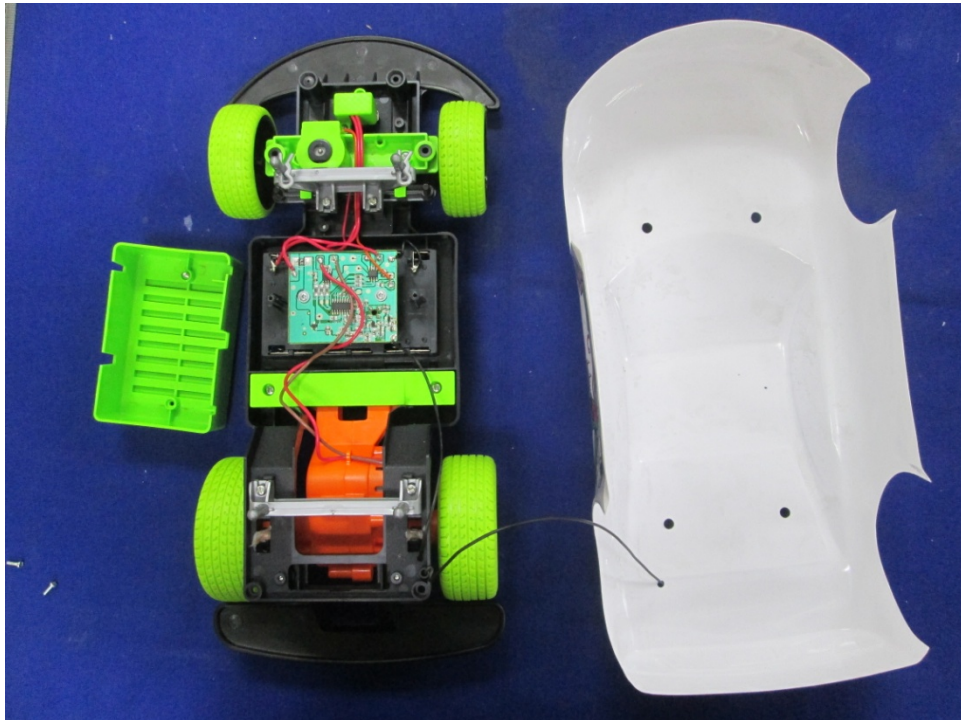
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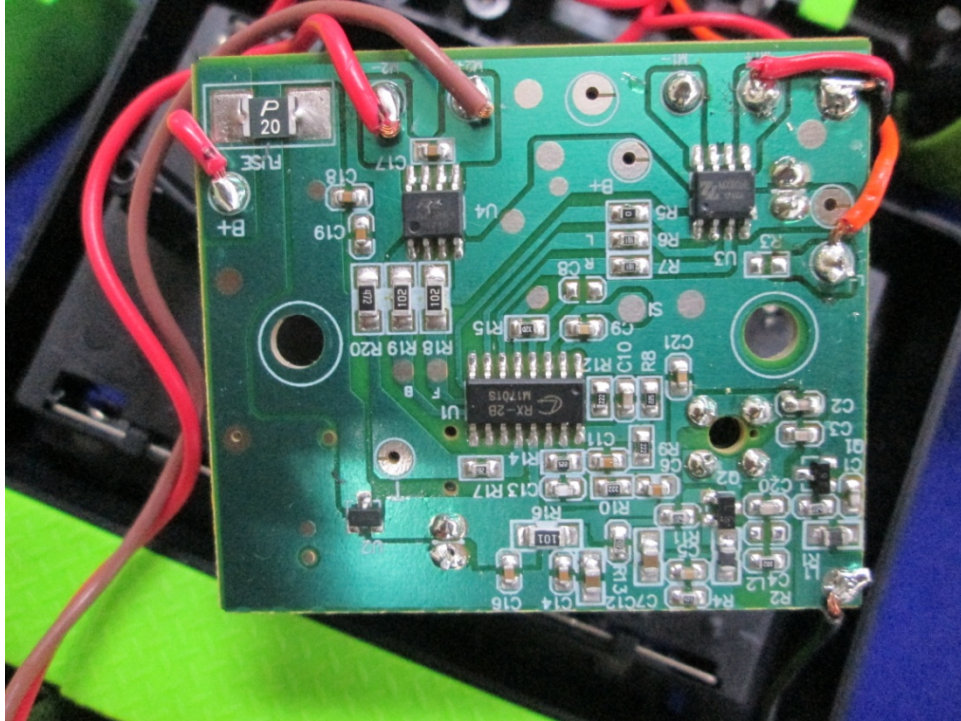
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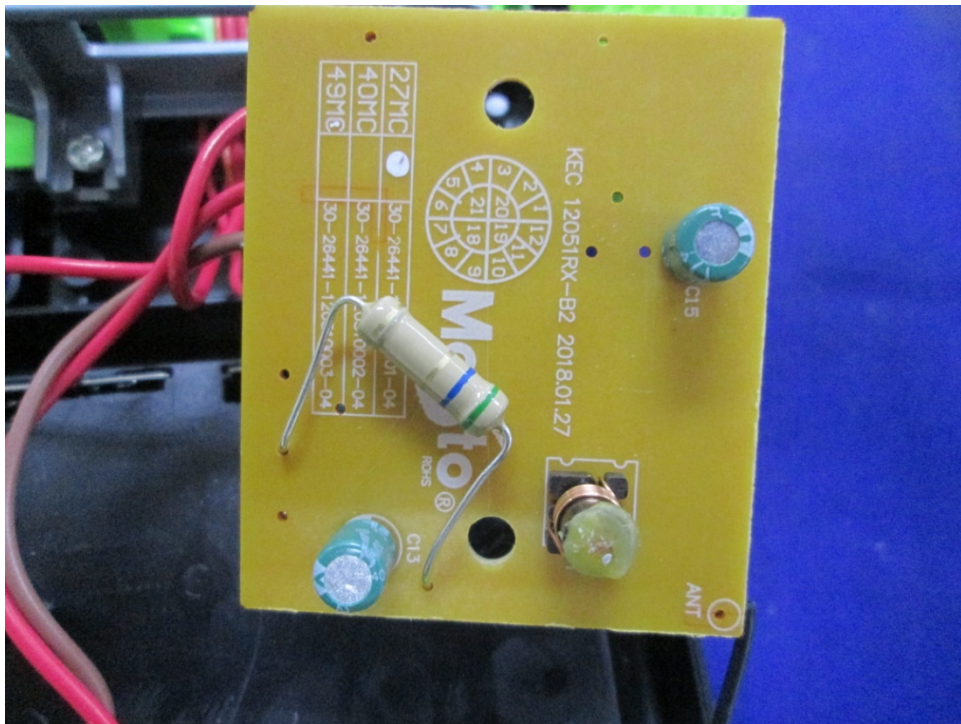
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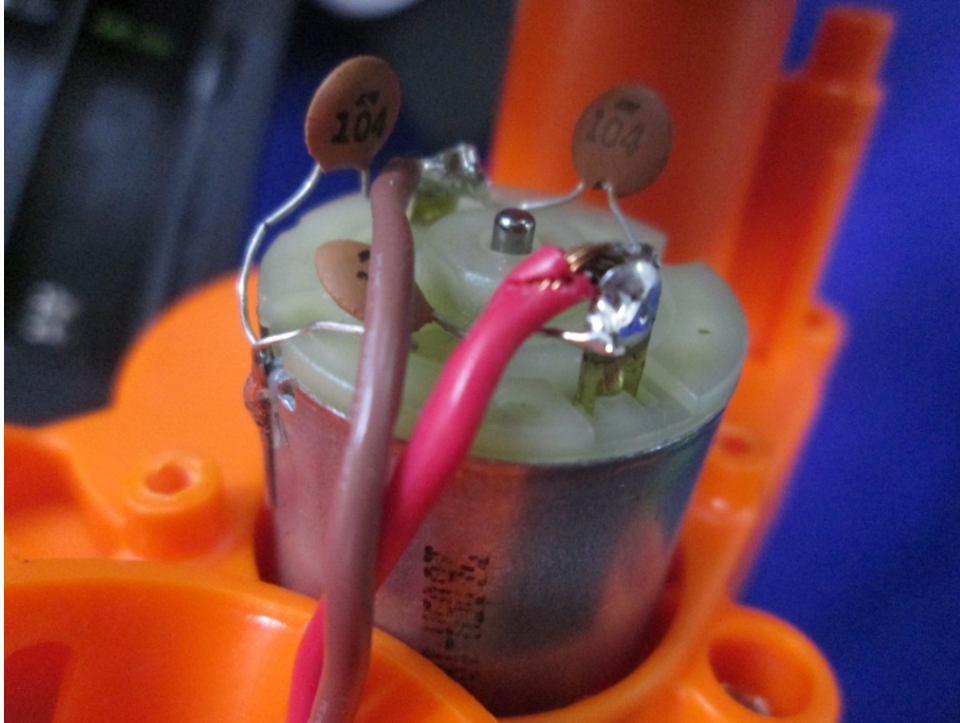
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Internal Photo



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