

MAY CHEONG TOY PRODUCTS FTY., LTD

TEST REPORT

SCOPE OF WORK

RAIDO FREQUENCY AND EMC TESTING—MODEL: 81018(13086/81077)

REPORT NUMBER

SZHH01152712-001S5

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RADIO COMMUNICATIONS AND EMC TESTING REPORT

MAY CHEONG TOY PRODUCTS FTY., LTD

Product Description: 1:24 Radio Control Vehicles, Assorted
Additional Names: See Page 7

Model: 81018(13086/81077)
Additional Models: See Page 7

Test Report : SZHH01152712-001S4

Remark: This report bases on the previous report with report No. SZHH01152712-001S4 dated 30 Oct 2019. Only added add model numbers, don't test after engineer evaluate.

Testing Engineer :	Maura Wang Engineer	Signed On File
Report Approved By :	Jimmy Wen Assistant Manager	
Date :	18 Dec 2019	

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RADIO PERFORMANCE MEASUREMENTS RESULT SUMMARY

	ETSI EN 300 220-2	ETSI EN 300 220-1	Compliance
	Clause Number		
Operating Frequency	4.2.1	5.1.1	Complied
Effective Radiated Power	4.3.1	5.2.1	Complied
Unwanted emissions in the spurious domain (Transmitter Portion)	4.2.2	5.9.1	Complied
Unwanted emissions in the spurious domain (Receiver Portion)	4.2.2	5.9.1	Complied
Adjacent Channel Power	4.3.7	5.11.1	Complied
Tx Out Of Band Emissions	4.3.5	5.8.1	N/A
TX behaviour Under Low-voltage Conditions	4.3.8	5.12.1	Complied
Transient Power	4.3.6	5.10.1	Complied
Blocking	4.4.2	5.18.1	Complied
Occupied Bandwidth	4.3.4	5.6.1	Complied
Duty Cycle	4.3.3	5.4.1	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	7.1	8.2	Complied
Electrostatic Discharge	7.2	9.3	Complied
Radio Frequency Electromagnetic Field (80MHz-6GHz)	7.2	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 : 1:24 Radio Control Vehicles, Assorted

Brand Name(s) / Type Number(s) : Maisto / 81018(13086/81077)

Serial Number(s) : Not Labelled

Equipment Received : 11 May 2017

Test Date(s) : 11 May 2017 to 21 May 2017

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

1 INTRODUCTION

Intertek Testing Services Shenzhen Ltd. Longhua Branch has tested the MAY CHEONG TOY PRODUCTS FTY., LTD , 1:24 Radio Control Vehicles, Assorted , 81018(13086/81077). The sample was tested to the relevant performance specification published by the European Telecommunications Standards Institute. We found that the unit met the essential requirement when tested as received. This report contains the results of these tests and is submitted to MAY CHEONG TOY PRODUCTS FTY., LTD as the final test results.

The model: 81018 is package numbers which include a transmitter and a receiver, the transmitter model number is 13086, receiver model number is 81077. The additional transmitter models: 12093, 13044, 13092 are same as the model: 13086 and the additional package numbers are same as the model: 81018 in hardware aspect. Theirs models are difference in the appearance and model number and model names.

The additional package numbers corresponding to product name listing:

Production name	Model No.
1:24 Licensed R/C Vehicles, Asst. ; 1:24 R/C Asst.;	81016/81017/81018/81056/81141/81217/
1:24 Radio Control vehicles, Assorted;	83018 (81051/81052/81053/81054/81055/81057/
1:24 CSRC with working headlights Asst.;	81058/81059/81061/81062/81063/81064/81065/
1:24 CSRC with working headlights Asst.;	81066/81067/81068/81073/81074/81078/81079/
1:24 R/C with stick controller, Asst.;	81082/81086/81091/81126/81142/81087/81088/
1:24 R/C in mailer box pack;	81089/81159/81185/81186/81090/81160/81501/81502 ;
1:24 H-D Custom RC VW Van Samba;	81681(81144)81165 (10043/10044);
Radio Control Vehicle 7.5" non-licensed R/C;	81250(81251/81252/81253/81254/81255);
1:14 R/C Formula, asst. ; 1:24 Race R/C, Asst.;	81140 (81145/81146/81147/81148/81181/81194);
HD RC Motorcycle - XL 1200N Nightster With Rider	81660(81661) ; 81190/81191/81074/81084/ 81143/
1:24 Ferrari RC - Ferrari SF15-T;	81127 ; 81202(12051/12118);
1:24 Red Bull RC - Infiniti Red Bull Racing RB11;	82066/82086(15961/13086);
Radio Control Vehicle 1:24 Formula R/C - Ferrari F138;	82040 (82041/82042); 81210
Radio Control Vehicle 1:18 R/C Red Bull Racing RB9;	(81211/81212/81213/8124/81215/81216);
Radio Control Vehicle 1:24 R/C Red Bull Racing RB9;	82070(82075/82076/82077/82078/82079/
1:16 R/C Recon Rove; Radio Control Vehicle Light Runners R/C,	82080/82081/82082/82083/82084);
Asst. ;Cyklone 360 ; Cyklone 360; 1:16 Harley-Davidson Custom	82054/ 82094 (16932 /16890);
RC ;1:24 R/C in horizontal smaller box;	82170(82164/82165/82166/82167/82168/82169);
1:10 Badlanders asst.; Cyklon Twist / Cyklon Twist;	81276, 81272P, 82091,
1:18 Vision GT RC, asst.; R/C CYKLONE 360 TURBO POLICE; 1/14	81219/81204/81380/81381/81382/813
R/C Chevrolet Camaro SS PATROL POLICE; 1:24 RC Samba bus	83/81384/81385/81386/81387/81388/81389/81390
with Light & Sound function, emergency decoration	82048/81504/81506
1:24 Red Bull RC - Infiniti Red Bull Racing RB13	81442/82503(18797)
1:24 Racing Series RC - 2017 Ferrari Formula 1 SF70-H	81507/81508/81509/81510/81511/81512/81513/81514/
	81515/81516/81517/81518/81519/81520
	82321/82322/82323/82324/82325

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

2 TEST SPECIFICATION

2.1 RELEVANT PERFORMANCE SPECIFICATION

The relevant performance specifications for MAY CHEONG TOY PRODUCTS FTY., LTD, 81018(13086/81077), 1:24 Radio Control Vehicles, Assorted are ETSI EN300 220-1 V3.1.1 (2017-02). The harmonised standards are ETSI EN 300 220-2 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 laboratory in Shenzhen. 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 consisted of one transmitter and one receiver.

2.4 TEST POWER SOURCES

The sample of transmitter is intended to operate from battery DC 3.0V (2 x 1.5V AAA batteries). The test power source voltage declared by the manufacturer were:

Nominal test voltage (V_{nom})	3.0	VDC
Lower extreme test voltage (V_{min})	2.4	VDC
Upper extreme test voltage (V_{max})	3.0	VDC

The sample of receiver is intended to operate from battery DC 3.0V (2 x 1.5V AA batteries)

2.5 TEST FREQUENCIES

The nominal operating frequency 40.685MHz at 3.0VDC.

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

None.

EXHIBIT 2

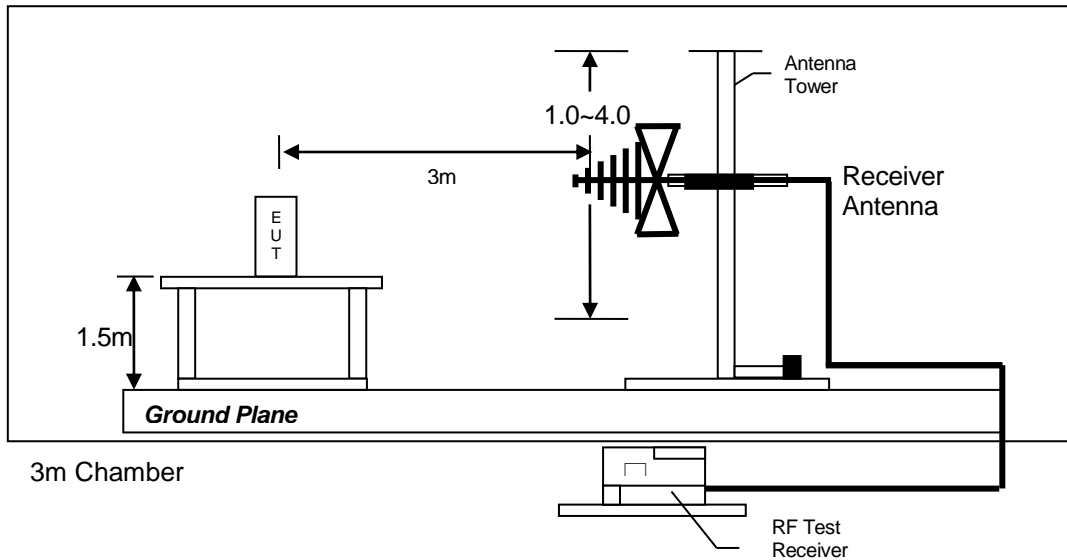
TEST RESULT OF RADIO PERFORMANCE MEASUREMENTS

3 EFFECTIVE RADIATED POWER (ERP) AND SPURIOUS EMISSIONS

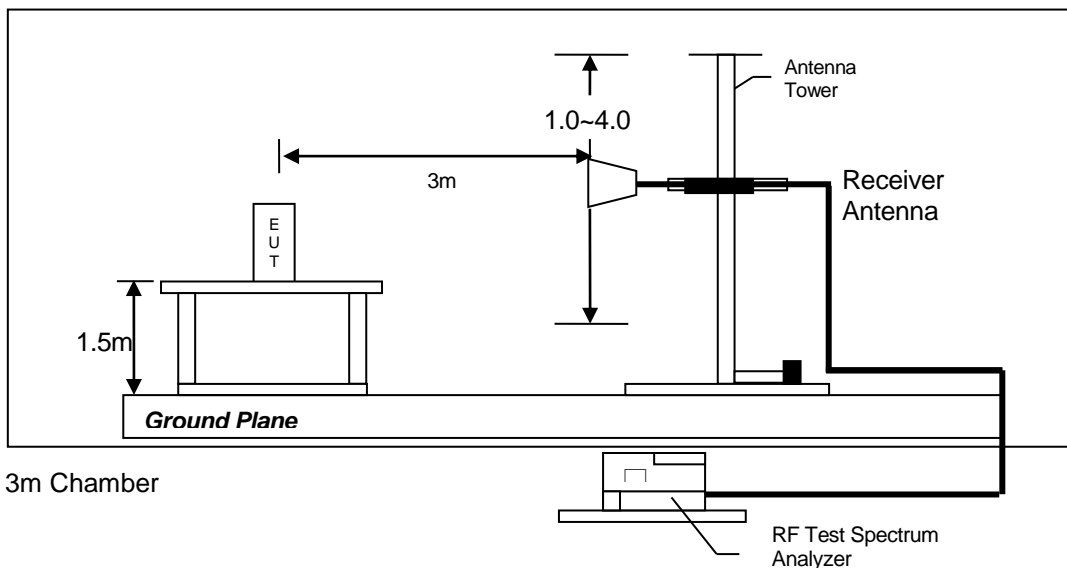
3.1 TEST METHOD AND SUMMARY

	Effective Radiated Power (ERP)	Spurious Emissions	
Basic Standard :	ETSI EN 300 220-2 V3.1.1 (2017-02)		
Clause :	4.3.1	4.2.2	4.2.2
Application :	Transmitter with an Integral or Dedicated Antenna	All Transmitters	All Receivers

3.2 TEST SETUP



Test setup of radiated emissions of 25MHz to 1GHz



Test setup of radiated emissions above 1GHz

3.3 EQUIPMENT LIST

Equipment No.	Equipment	Manufacturer	Model No.	Calibration Date	Next Calibration Due Date
SZ185-01	EMI Receiver	R&S	ESCI	6-Jan-17	6-Jul-17
SZ056-03	Spectrum Analyzer	R&S	FSP	14-Jun-16	14-Jun-17
SZ061-03	BiConiLog Antenna	ETS	3142C	12-Oct-16	12-Oct-17
SZ061-07	Pyramidal Horn Antenna	ETS	3115	12-Oct-16	12-Oct-17
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	30-May-16	30-May-17
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	16-Apr-16	16-Apr-18
SZ062-02	RF Cable	RG 213U	N/A	6-Jan-17	6-Jul-17
SZ062-05	RF Cable	0.04-26.5GHz	N/A	16-Mar-17	16-Sep-17

3.4 TEST RESULT – EFFECTIVE RADIATED POWER (ERP) - TRANSMITTER PORTION

Test Conditions: Temperature 22.4°C; Humidity 43.7%

Polarization	Frequency (MHz)	ERP (mW)	ERP (dBm)	Limit (dBm)	Margin (dB)
V	40.685000	0.3200	-4.9	10	-14.9

Notes:

1. Negative sign (-) in the margin column signify levels below the limit.
2. 10dBm corresponds to 10mW
3. Measurement uncertainty is ± 4.8 dB at a level of confidence of 95%.

3.5 TEST RESULT – SPURIOUS EMISSIONS (TRANSMITTER PORTION)

3.5.1 CONDUCTED

Not applicable. Equipment has Integral antenna.

3.5.2 RADIATED

3.5.2.1 SPURIOUS EMISSIONS – OPERATING

Test Conditions: Temperature 22.4°C; Humidity 43.7%

Polarization	Frequency (MHz)	ERP at 3m (dBm)	ERP Limit at 3m (dBm)	Margin (dB)
V	80.540	-40.4	-36.0	-4.4
V	162.740	-60.2	-36.0	-24.2
V	203.425	-68.1	-54.0	-14.1
V	244.180	-60.3	-36.0	-24.3
V	284.795	-61.9	-36.0	-25.9
V	365.920	-63.2	-36.0	-27.2

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. -54 dBm corresponds to 4 nW
4. -47 dBm corresponds to 20 nW.
5. -36 dBm corresponds to 250 nW
6. -30 dBm corresponds to 1000 nW.
7. Measurement uncertainty is ± 4.8 dB at a level of confidence of 95%.

3.5.2.2 SPURIOUS EMISSIONS – STANDBY

- There were no emissions found above system measuring level (at least 10 dB below the limit).
- The transmitter cannot be operated in the standby mode. (WITHOUT STAND-BY MODE)
- (STAND BY MODE WITH TABLE)

Polarization	Frequency (MHz)	ERP at 3m (dBm)	ERP Limit at 3m (dBm)	Margin (dB)
/	/	/	/	/

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. -36 dBm corresponds to 250 nW
6. -30 dBm corresponds to 1uW.
7. Measurement Uncertainty : ± 4.8 dB at a level of confidence of 95%.

3.6 TEST RESULT – SPURIOUS EMISSIONS (RECEIVER PORTION)

3.6.1 CONDUCTED

Not applicable. Equipment has integral antenna.

3.6.2 RADIATED

3.6.2.1 SPURIOUS EMISSIONS – OPERATING

Test Conditions: Temperature 25.8 (°C); Humidity 59 (%)

Frequency (MHz)	Measured Power (dBm)	Limit (dBm)	Margin (dB)
/	/	/	/

There were no emissions found above system measuring level (at least 10 dB below the limit).

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%.

3.6.2.2 SPURIOUS EMISSIONS – OPERATING

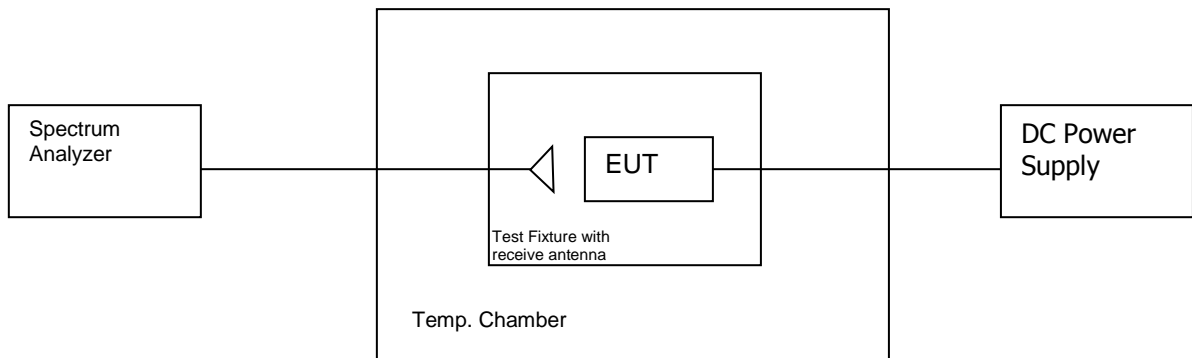
No Test Result.

4 OPERATING FREQUENCY

4.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 220-2 V3.1.1 (2017-02)
Clause :	4.2.1
Application :	all transmitter

4.2 TEST SETUP



4.3 EQUIPMENT LIST

Equipment No.	Equipment	Manufacturer	Model No.	Calibration Date	Next Calibration Due Date
SZ056-03	Spectrum Analyzer	R&S	FSP 30	14-Jun-16	14-Jun-17
SZ016-02	Programmable Temperature & Humidity Chamber	DongZhiXun	WGD/SJ-415-A	9-Mar-17	9-Mar-18
SZ006-06	DC Power Supply	Guwei	GPR-6030D	14-Mar-17	14-Sep-17

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

4.4 TEST RESULT

Test Conditions		Frequency (MHz)	Frequency Drift (Hz)
Nominal frequency stated by the manufacturer: 40.685 MHz			
H _{nom} 50 % T _{nom} 25 C	V _{DC nom} DC 3.0V	40.685MHz	0
Value		Notes	
Operational Frequency Band		40.660MHz - 40.700MHz	Declared by manufacturer
Nominal Operating Frequency		40.685MHz	Declared by manufacturer
Operating Channel Width- OCW		16.8kHz	Declared by manufacturer

Note:

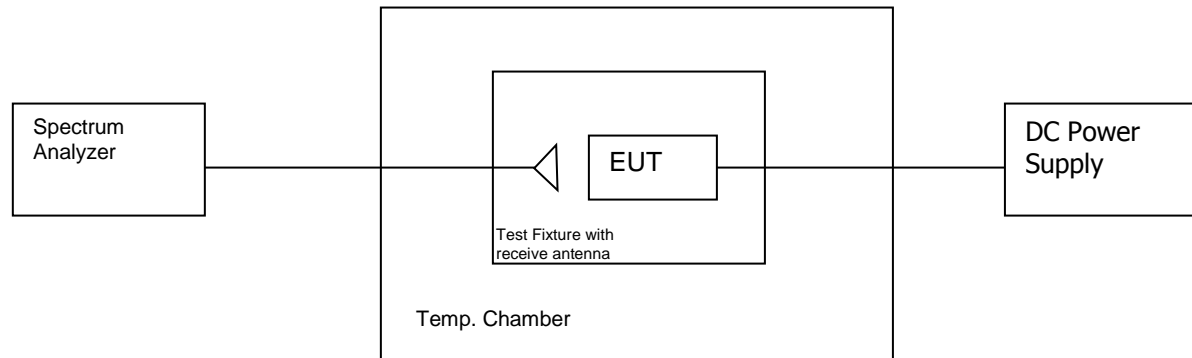
1. The Assigned Frequency Band is 40.66MHz - 40.70MHz MHz.
- 2.. Measurement uncertainty is ± 0.5 ppm at a level of confidence of 95%.

5 ADJACENT CHANNEL POWER (Applies to EUT with OCW ≤ 25KHz)

5.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 220-2 V3.1.1 (2017-02)
Clause :	4.3.7
Application :	all transmitter with OCW ≤ 25 kHz

5.2 TEST SETUP



5.3 EQUIPMENT LIST

Equipment No.	Equipment	Manufacturer	Model No.	Calibration Date	Next Calibration Due Date
SZ056-03	Spectrum Analyzer	R&S	FSP 30	14-Jun-16	14-Jun-17
SZ016-02	Programmable Temperature & Humidity Chamber	DongZhiXun	WGD/SJ-415-A	9-Mar-17	9-Mar-18
SZ006-06	DC Power Supply	Guwei	GPR-6030D	14-Mar-17	14-Sep-17

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

5.4 TEST RESULT

5.4.1 TEST RESULT – DC TEST VOLTAGE

Adjacent Channel Power

Test Conditions <input checked="" type="checkbox"/> OCV < 20kHz / <input type="checkbox"/> 20kHz ≤ OCV ≤ 25kHz	Adjacent channel	Attenuation (dBc)	Adjacent channel power (dBm)	Limit (dBm)	Result
V _{nom} : 3.0V T _{nom} : 25°C RH _{nom} : 50%	Lower	10.2	-38.2	-20.0 dBm	Complied
	Upper	10.2	-36.0		Complied
V _{max} : 3.0V T _{max} : 55°C RH _{max} : 50 % V _{min} : 2.4V T _{max} : 55°C RH _{max} : 50 %	Lower	10.2	-35.5	-15.0 dBm	Complied
	Upper	10.2	-34.5		Complied
	Lower	10.2	-36.1		Complied
	Upper	10.2	-35.8		Complied
V _{max} : 3.0V T _{min} : -20°C RH _{min} : 0 % V _{min} : 2.4V T _{min} : -20°C RH _{min} : 0 %	Lower	10.2	-38.7		Complied
	Upper	10.2	-39.3		Complied
	Lower	10.2	-39.0		Complied
	Upper	10.2	-40.2		Complied

Alternate Adjacent Channel Power

Test Conditions <input checked="" type="checkbox"/> OCW < 20kHz / <input type="checkbox"/> 20kHz ≤ OCW ≤ 25kHz	Adjacent channel	Attenuation (dBc)	Adjacent channel power (dBm)	Limit (dBm)	Result
V _{nom} : 3.0V T _{nom} : 25°C RH _{nom} : 50%	Lower	10.2	-33.5	-20.0 dB	Complied
	Upper	10.2	-33.5		Complied
V _{max} : 3.0V T _{max} : 55°C RH _{max} : 50 % V _{min} : 2.4V T _{max} : 55°C RH _{max} : 50 %	Lower	10.2	-37.5	-20.0 dBm	Complied
	Upper	10.2	-37.1		Complied
	Lower	10.2	-38.3		Complied
	Upper	10.2	-38.3		Complied
V _{max} : 3.0V T _{min} : -20°C RH _{min} : 0 % V _{min} : 2.4V T _{min} : -20°C RH _{min} : 0 %	Lower	10.2	-40.5		Complied
	Upper	10.2	-40.8		Complied
	Lower	10.2	-41.3		Complied
	Upper	10.2	-41.5		Complied

Remark:

- 15.0dBm corresponds to 32 μW
- 20.0dBm corresponds to 10 μW
- 32.0dBm corresponds to 630 nW
- 37.0dBm corresponds to 200 nW
- 40.0dBm corresponds to 100 nW

Note:

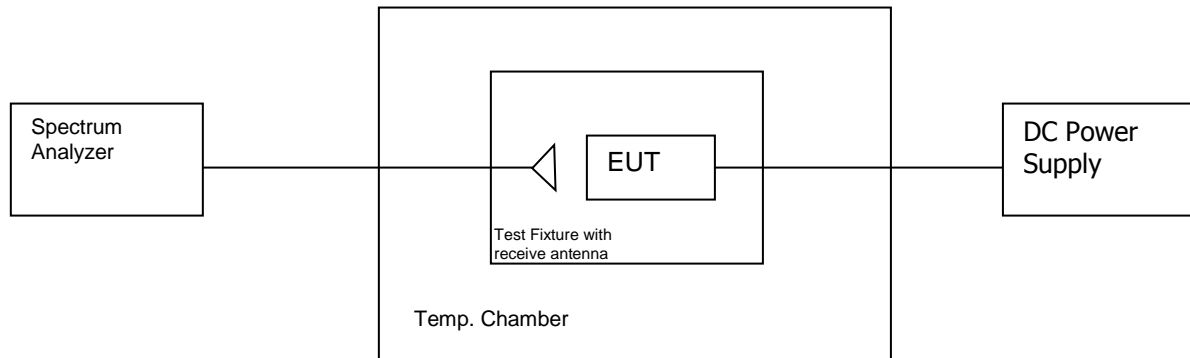
Measurement uncertainty is ±3.0dB at a level of confidence of 95%.

6 TX OUT OF BAND EMISSIONS (Applies to EUT with OCW > 25KHz)

6.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 220-2 V3.1.1 (2017-02)
Clause :	4.3.5
Application :	all transmitter with OCW >25 kHz

6.2 TEST SETUP



6.3 EQUIPMENT LIST

Equipment No.	Equipment	Manufacturer	Model No.	Calibration Date	Next Calibration Due Date
SZ056-03	Spectrum Analyzer	R&S	FSP 30	14-Jun-16	14-Jun-17
SZ016-02	Programmable Temperature & Humidity Chamber	DongZhiXun	WGD/SJ-415-A	9-Mar-17	9-Mar-18
SZ006-06	DC Power Supply	Guwei	GPR-6030D	14-Mar-17	14-Sep-17

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

6.4 TEST LIMIT

Domain	Frequency Range	RBW _{REF}	Max power limit
OOB limits applicable to Operational Frequency Band (See Figure 6)	$f \leq f_{low_OFB} - 400 \text{ kHz}$	10 kHz	-36 dBm
	$F_{low_OFB} - 400 \text{ kHz} \leq f \leq f_{low_OFB} - 200 \text{ kHz}$	1 kHz	-36 dBm
	$f_{low} - 200 \text{ kHz} \leq f < f_{high_OFB}$	1 kHz	See Figure 6
	$f = f_{low_OFB}$	1 kHz	0 dBm
	$f = f_{high_OFB}$	1 kHz	0 dBm
	$F_{high_OFB} < f \leq f_{high_OFB} + 200 \text{ kHz}$	1 kHz	See Figure 6
	$F_{high_OFB} + 200 \text{ kHz} \leq f \leq f_{high_OFB} + 400 \text{ kHz}$	1 kHz	-36 dBm
OOB limits applicable to Operating Channel (See Figure 5)	$F_{high_OFB} + 400 \text{ kHz} \leq f$	10 kHz	-36 dBm
	$f = f_c - 2.5 \times \text{OCW}$	1 kHz	-36 dBm
	$f_c - 2.5 \times \text{OCW} \leq f \leq f_c - 0.5 \times \text{OCW}$	1 kHz	See Figure 5
	$f = f_c - 0.5 \times \text{OCW}$	1 kHz	0 dBm
	$f = f_c + 0.5 \times \text{OCW}$	1 kHz	0 dBm
	$f_c + 0.5 \times \text{OCW} \leq f \leq f_c + 2.5 \times \text{OCW}$	1 kHz	See Figure 5
	$f = f_c + 2.5 \times \text{OCW}$	1 kHz	-36 dBm

NOTE: f is the measurement frequency.
 f_c is the Operating Frequency.
 F_{low_OFB} is the lower edge of the Operational Frequency Band.
 F_{high_OFB} is the upper edge of the Operational Frequency Band.
 OCW is the operating channel bandwidth.

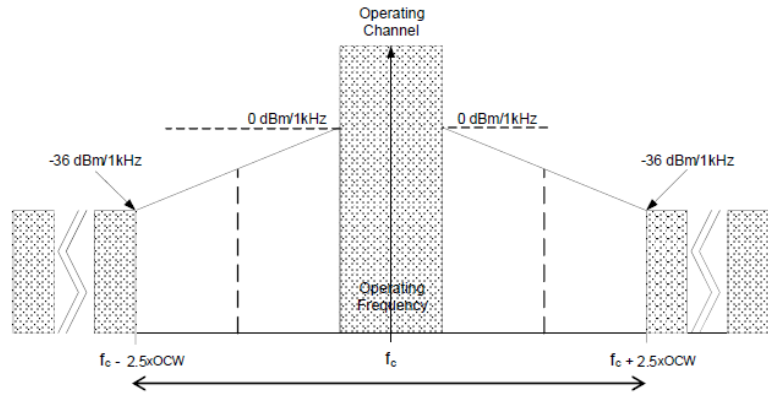


Figure 5: Out Of Band Domain for Operating Channel with reference BW

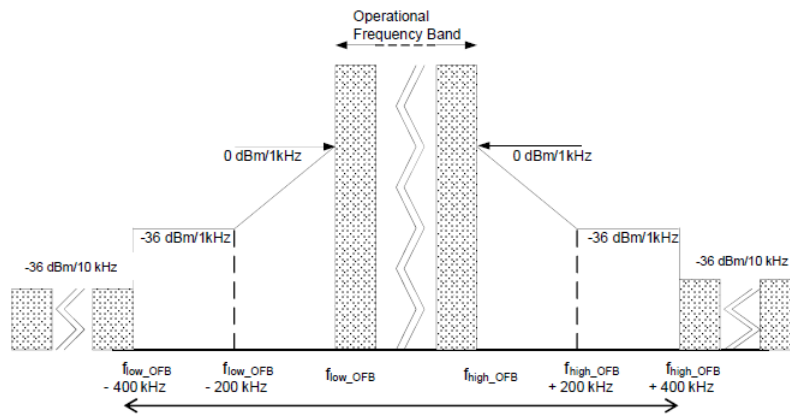


Figure 6: Out Of Band Domain for Operational Frequency Band with reference BW

6.5 TEST RESULT AND PLOTS

6.5.1 TEST RESULT – DC TEST VOLTAGE

Not Applicable

Remark:

1. 0.0dBm corresponds to 1mW
2. -36.0 dBm corresponds to 250nW
3. If the waveforms exceeds the limit mask, the test does not complied.

Note:

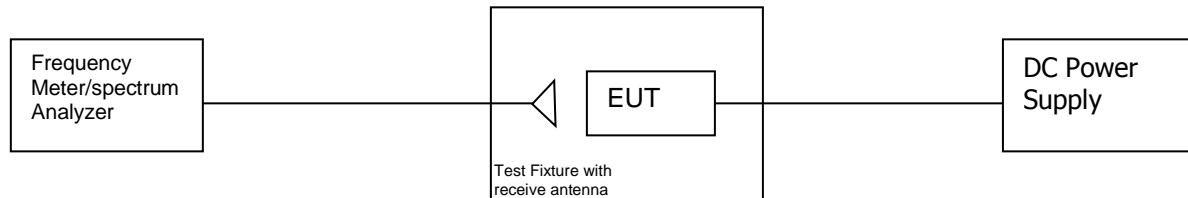
1. OCW is 16.8KHz
2. Measurement uncertainty is ± 3.0 dB at a level of confidence of 95%.

7 TX BEHAVIOUR UNDER LOW-VOLTAGE CONDITIONS

7.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 220-2 V3.1.1 (2017-02)
Clause :	4.3.8
Application :	Battery-Operated Transmitter

7.2 TEST SETUP



7.3 EQUIPMENT LIST

Equipment No.	Equipment	Manufacturer	Model No.	Calibration Date	Next Calibration Due Date
SZ056-03	Spectrum Analyzer	R&S	FSP 30	14-Jun-16	14-Jun-17
SZ016-02	Programmable Temperature & Humidity Chamber	DongZhiXun	WGD/SJ-415-A	9-Mar-17	9-Mar-18
SZ006-06	DC Power Supply	Guwei	GPR-6030D	14-Mar-17	14-Sep-17

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

7.4 TEST RESULT

Test Conditions: Ambient

Below Lower Extreme Test Voltage (V)	Frequency (MHz)	Frequency Drift (Hz)	Limit (Hz)	Result
2.4	40.685640	640	Within Operational Frequency Band	Complied
2.0	40.684360	-640	Within Operational Frequency Band	Complied
1.5	40.684170	-830	Within Operational Frequency Band	Complied
1.1	40.684080	-920	Within Operational Frequency Band	Complied

Notes:

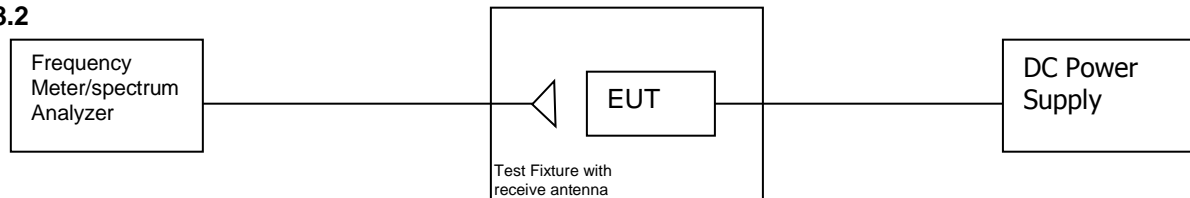
1. The effective radiated power of the transmitter is below the spurious emission limit. Therefore, the transmitter is deemed to comply with this test.
2. When the test voltage is below 1.1VDC, the effective radiated power of the transmitter is below the spurious emission limit.
3. The transmitter ceases to function below ___VDC.
4. The Assigned Frequency Band: 40.66MHz - 40.70MHz .
5. Measurement uncertainty is ± 17 Hz at a level of confidence of 95%.

8 TRANSIENT POWER

8.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 220-2 V3.1.1 (2017-02)
Clause :	4.3.6
Application :	All transmitters

8.2



8.3 EQUIPMENT LIST

Equipment No.	Equipment	Manufacturer	Model No.	Calibration Date	Next Calibration Due Date
SZ056-03	Spectrum Analyzer	R&S	FSP 30	14-Jun-16	14-Jun-17
SZ016-02	Programmable Temperature & Humidity Chamber	DongZhiXun	WGD/SJ-415-A	9-Mar-17	9-Mar-18
SZ006-06	DC Power Supply	Guwei	GPR-6030D	14-Mar-17	14-Sep-17

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

8.4 TEST RESULT

Test Conditions: Temperature 22.4°C; Humidity 43.7%

Measurement points: offset from centre frequency	Analyser RBW (kHz)	Limit (dBm)	Transient Power (dBm)	Result
- 0,5 x OCW - 3 kHz:*	1	0	N/A	N/A
+ 0,5 x OCW + 3 kHz:*				
- max (12,5 kHz, OCW):	Max (RBW pattern 1/3/10) ≤ Offset frequency/6 =	0	-46.6	Complied
+ max (12,5 kHz, OCW):			-46.8	
-0,5 x OCW - 400 kHz:	100	-27	-55.8	Complied
0,5 x OCW + 400 kHz:			-55.4	
-0,5 x OCW -1 200 kHz:	300	-27	-60.1	Complied
0,5 x OCW + 1200kHz:			-61.7	

*Not applicable for OCW <25kHz

8.5. TEST LIMIT:

Absolute offset from centre frequency	RBW _{REF}	Peak power limit applicable at measurement points
≤ 400 kHz	1 kHz	0 dBm
> 400 kHz	1 kHz	-27 dBm

Note:

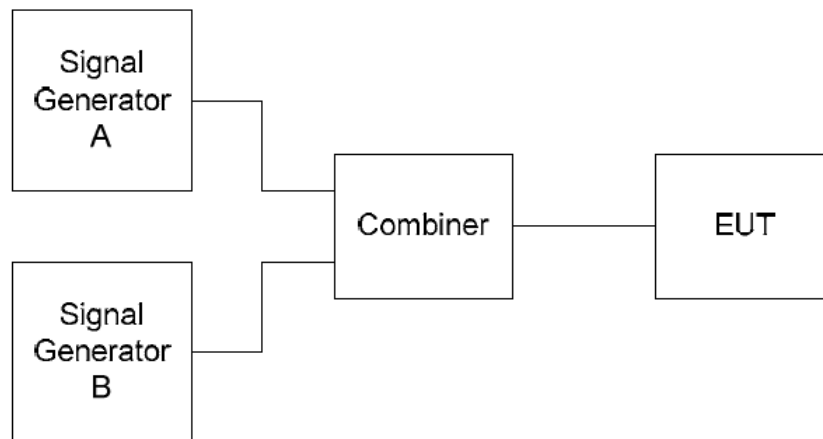
1. Measurement uncertainty is ± 4.8dB at a level of confidence of 95%.
2. OCW is 16.8KHz.

9 BLOCKING

9.1 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

9.2 TEST SETUP



9.3 EQUIPMENT LIST

Equipment No.	Equipment	Manufacturer	Model No.	Calibration Date	Next Calibration Due Date
SZ056-03	Spectrum Analyzer	R&S	FSP	14-Jun-16	14-Jun-17
SZ070-16	Combiner	Mini-Circuits	ZFSC-2-2500-S+	27-Oct-16	27-Oct-17
SZ180-01	Signal Generator	R&S	SML03	23-May-16	23-May-17
SZ180-02	Signal Generator	Aeroflex	2023A	9-Feb-17	9-Feb-18
SZ070-18	Adjust Attenuator	Agilent	8495B & 8494B	9-Feb-17	9-Feb-18
SZ006-06	DC Power Supply	Guwei	GPR-6030D	14-Mar-17	14-Sep-17
SZ068-01	Acoustical Shielded Case	R/S	AF-BOX	6-Jan-17	6-Jul-17
SZ062-14	RF cable	Tek	Torc080	6-Jan-17	6-Jul-17

9.4 TEST RESULT

Test Conditions: Temperature 22.4°C; Humidity 43.7%

Power level of Signal Generator A = -19.8dBm

Test Frequency offset (MHz) (OCW: <u>16.8</u> KHz) (Centre Frequency: <u>40.685</u> MHz)		Unwanted Emission Power Level Signal B (dBm)	Limit (For Receiver Category 3)	Result
OC Edge +/-2MHz	Lower: 38.685MHz	-5.6	-80 dBm	Complied
	Upper: 42.685MHz	-6.7		Complied
OC Edge +/-10MHz	Lower: 30.685 MHz	-4.3	-60 dBm	Complied
	Upper: 50.685MHz	-3.3		Complied
MAX (+/-5% of F _{Centre} or +/- 15 MHz)	Lower: 25.685MHz	-0.1	-60 dBm	Complied
	Upper: 55.685MHz	-0.5		Complied

Note:

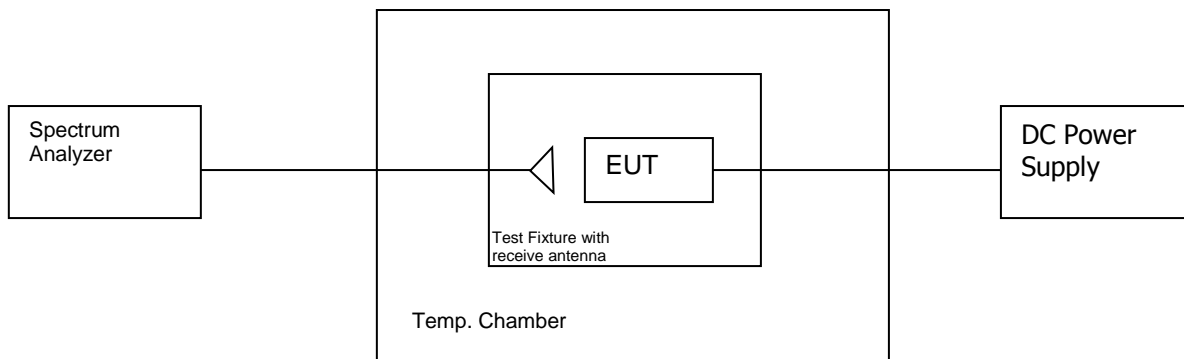
1. Measurement uncertainty is ± 4.8 dB at a level of confidence of 95%.

10 OCCUPIED BANDWIDTH

10.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 220-2 V3.1.1 (2017-02)
Clause :	4.3.4
Application :	All transmitter

10.2 TEST SETUP



10.3 EQUIPMENT LIST

Equipment No.	Equipment	Manufacturer	Model No.	Calibration Date	Next Calibration Due Date
SZ056-03	Spectrum Analyzer	R&S	FSP 30	14-Jun-16	14-Jun-17
SZ016-02	Programmable Temperature & Humidity Chamber	DongZhiXun	WGD/SJ-415-A	9-Mar-17	9-Mar-18
SZ006-06	DC Power Supply	Guwei	GPR-6030D	14-Mar-17	14-Sep-17

10.4 TEST RESULT

Test Conditions		Occupied Bandwidth(kHz)	Flow (MHz)	F _{high} (MHz)
Nominal frequency stated by the manufacturer: 40.685 MHz				
T _{nom} 25°C H _{nom} 50%	V _{DC nom} 3.0V	16.787300	40.676607	40.693394
T _{min} -20°C H _{min} 0%	V _{DC max} 3.0V	16.787340	40.676606	40.693394
	V _{DC min} 2.4V	16.787320	40.676606	40.693394
T _{max} 55°C H _{max} 50%	V _{DC max} 3.0V	16.787310	40.676606	40.693394
	V _{DC min} 2.4V	16.787300	40.676607	40.693394

Maximum Occupied Bandwidth 16.787340 (kHz)

	Frequency (MHz)	Within Assigned Frequency Band
Lowest F _{LM} F _{LM}	40.676606	Complied
Highest F _{HM} F _{HM}	40.693394	Complied

Test environment Normal or extreme conditions

Centre Frequency The highest or lowest operating frequency as declared by the manufacturer and any other frequencies used in the test case

Occupied Bandwidth The value measured with the spectrum analyzer

Maximum Occupied Bandwidth Highest measured OBW value or if the measurement is only performed at normal temperature conditions, the upper and lower frequency error results have to be added and subtracted to measured OBW to calculate the Maximum Occupied Bandwidth

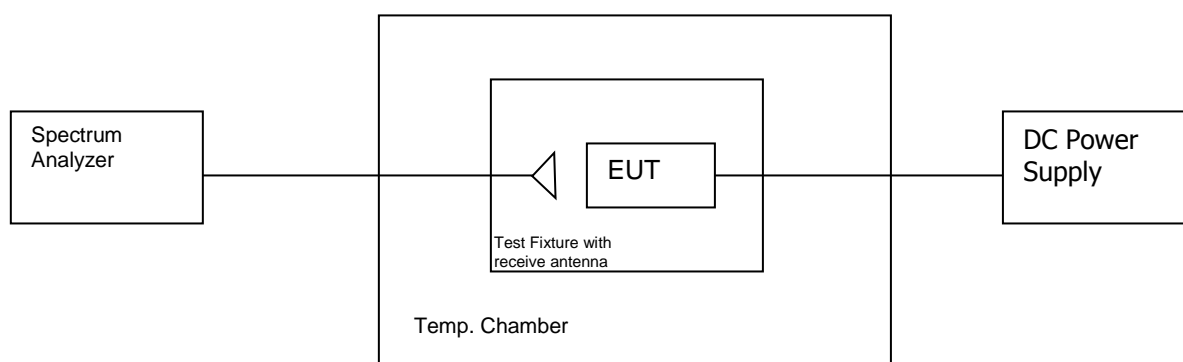
Measurement uncertainty is ± 5% ppm at a level of confidence of 95%.

11 DUTY CYCLE

11.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 220-2 V3.1.1 (2017-02)
Clause :	4.3.3
Application :	All transmitter

11.2 TEST SETUP



11.3 EQUIPMENT LIST

Equipment No.	Equipment	Manufacturer	Model No.	Calibration Date	Next Calibration Due Date
SZ056-03	Spectrum Analyzer	R&S	FSP 30	14-Jun-16	14-Jun-17
SZ016-02	Programmable Temperature & Humidity Chamber	DongZhiXun	WGD/SJ-415-A	9-Mar-17	9-Mar-18
SZ006-06	DC Power Supply	Guwei	GPR-6030D	14-Mar-17	14-Sep-17

11.4 TEST RESULT

Test Conditions: Temperature 22.4°C; Humidity 43.7%

No requirement for Frequency Band on 40.66 MHz to 40.70MHz refer to Annex B, Table B.1 and Band No. A or C.of the harmonised standard.

EXHIBIT 3

TEST RESULT OF EMC COMPLIANCE MEASUREMENTS

12 EMC EMISSION TEST

12.1 TEST METHOD AND SUMMARY

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

12.2 RADIATED EMISSION TEST

12.2.1 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Calibration Date	Next Calibration Due Date
SZ185-01	EMI Receiver	R&S	ESCI	23-Jan-16	23-Jan-17
SZ061-03	BiConiLog Antenna	ETS	3142C	14-Jun-16	14-Jun-17
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	16-Apr-16	16-Apr-18
SZ062-04	RF Cable	RADIALL	RG 213U	7-Apr-16	7-Oct-16
SZ062-13	RF Cable	Habia	0.026-26.5GHz	7-Apr-16	7-Oct-16

12.2.2 TEST RESULT

Worst-case Operating Mode: Forward running (Motor)

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	324.395	33.5	23.0	37.0	-14.0
H	455.830	32.1	21.6	37.0	-15.4
H	868.080	40.9	30.4	37.0	-6.6
V	81.410	33.1	22.6	30.0	-7.4
V	306.935	34.2	23.7	37.0	-13.3
V	874.870	40.9	30.4	37.0	-6.6

Notes:

1. Quasi-Peak Detector Data.
2. Frequency range scanned: 30 MHz to 1000 MHz.
3. Only emissions significantly above equipment noise floor are reported.
4. Measurement uncertainty is ± 4.8 dB at a level of confidence of 95%.

13 ELECTROSTATIC DISCHARGE

13.1 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) ±4.0 kV (Contact Discharge) ±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 :		TX : Stand-by and Transmission Modes, Power-Off RX : Stand-by and Operating (Motor), Power-Off
Test Setup :		Table-top
Temperature :		27.1°C
Relative Humidity :		42.3%
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

13.2 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ189-03	ESD Simulator	Teseq	NSG 435	9-Nov-16	9-Nov-17

13.3 TEST RESULT**13.3.1**

Discharge Type	Applied Voltage	Result (Pursuant to ETSI EN 301 489-3 Criterion TT & 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

13.3.2 ADDITIONAL RESULT INFORMATION

No observable change.

14 RADIO FREQUENCY ELECTROMAGNETIC FIELD

14.1 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 :	23.8°C
Relative Humidity :	54.0%
Test Facility :	Full Anechoic Chamber
Antenna Polarization :	Horizontal and Vertical
Type of Antenna :	Biconical / Log-periodic / Horn
Test Distance :	3m
Test Mode :	TX : Stand-by and Transmission Modes, Power-Off RX : Stand-by and Operating (Motor), Power-Off
Test Setup :	Table-top

14.2 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ061-04	BiConiLog Antenna	ETS	3142C	17-Oct-15	17-Oct-16
SZ180-01	Signal Generator	R&S	SML03	23-May-16	23-May-17
SZ181-07	Power Amplifier	MILMEGA	AS0827-110	23-Jan-17	23-Jan-18
SZ182-01	RF Power Meter	BOONTON	4232A	23-Jan-17	23-Jan-18
SZ188-02	Anechoic Chamber	ETS	RFD-F/A-100	16-Apr-16	16-Apr-18
SZ062-01	RF Cable	RADIALL	RG 213U(3M)	7-Apr-17	7-Oct-17
SZ062-02	RF Cable	RADIALL	RG 213U(6M)	7-Apr-17	7-Oct-17

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

14.3 TEST RESULT**14.3.1**

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

14.3.2 ADDITIONAL RESULT INFORMATION

No observable change.

EXHIBIT 4

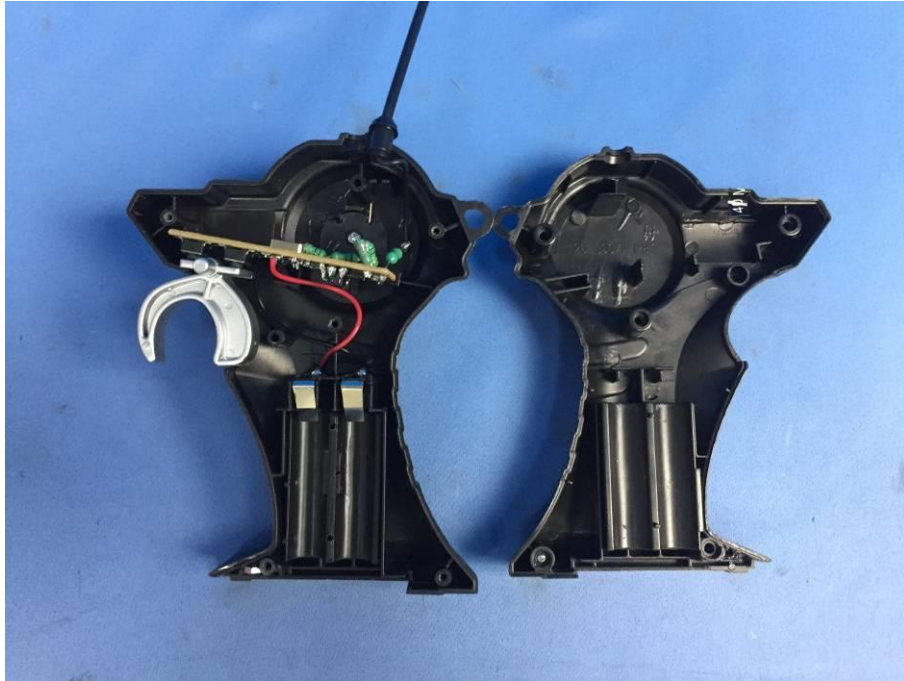
PHOTOS OF EUT

15 EUT PHOTOS

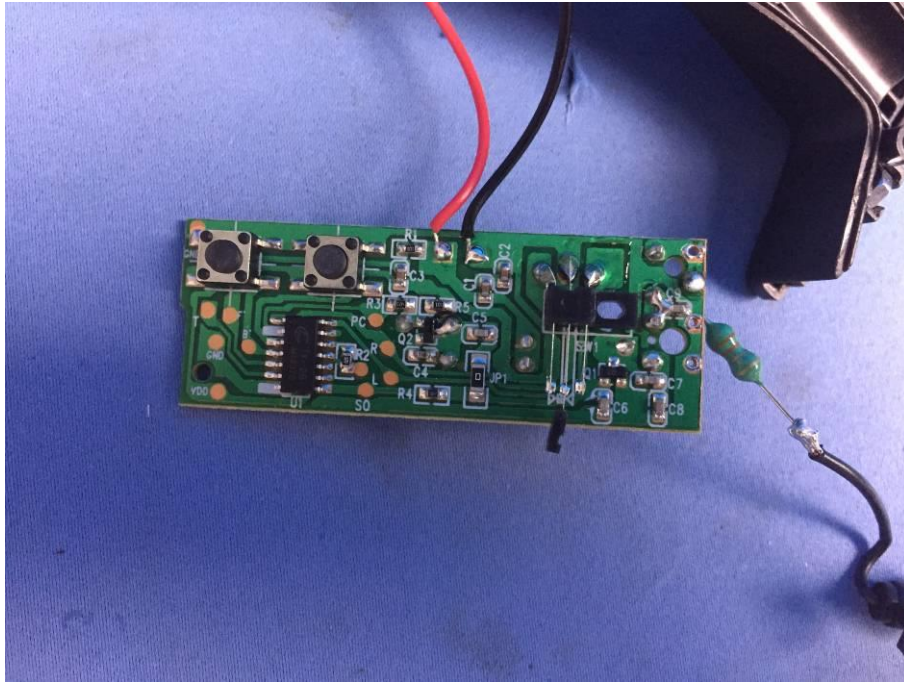
EXTERNAL PHOTO (TX&RX)



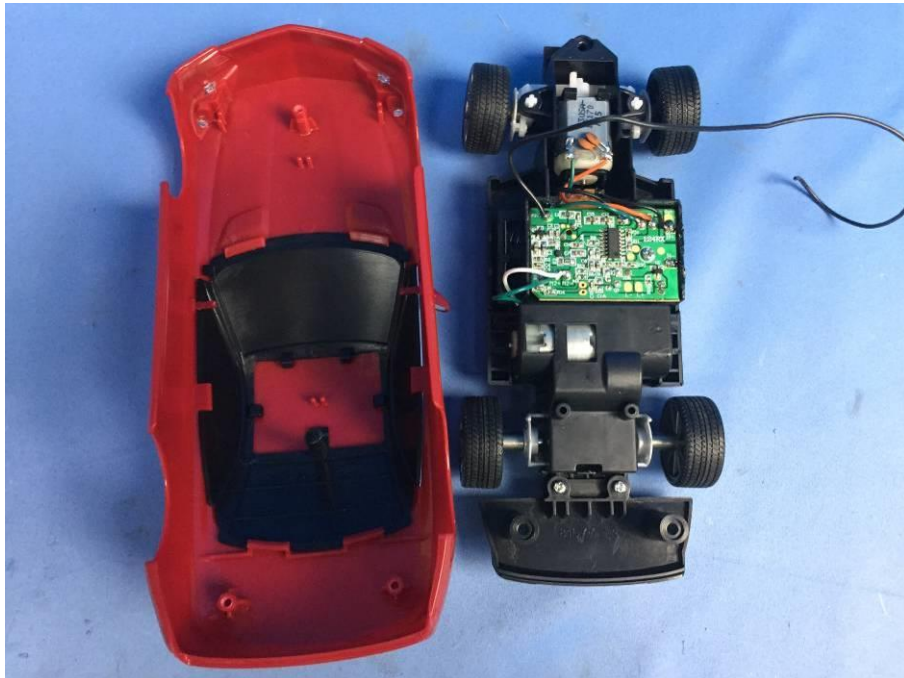
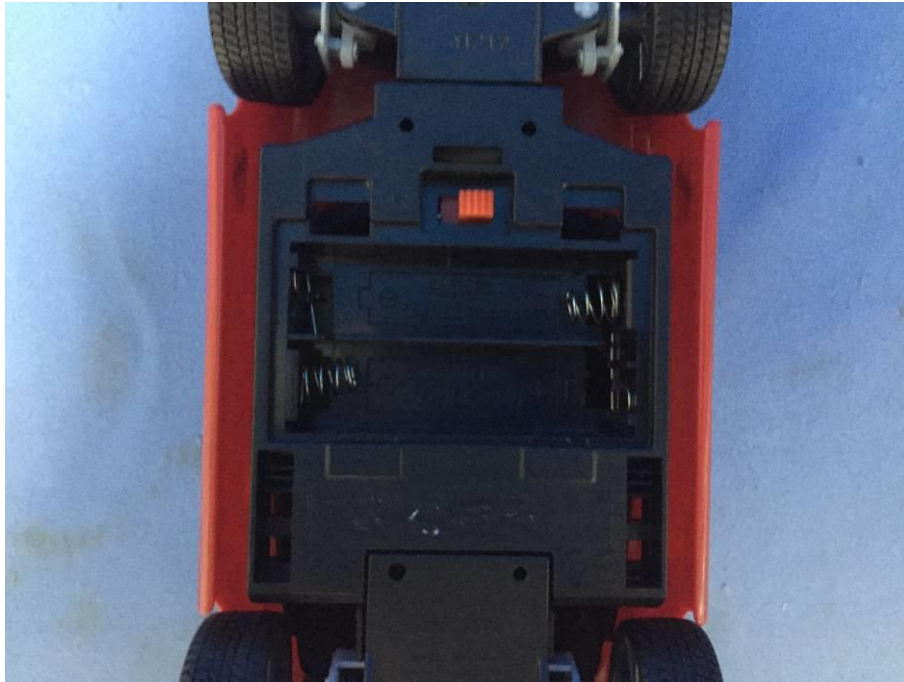
INTERNAL PHOTO (TX)



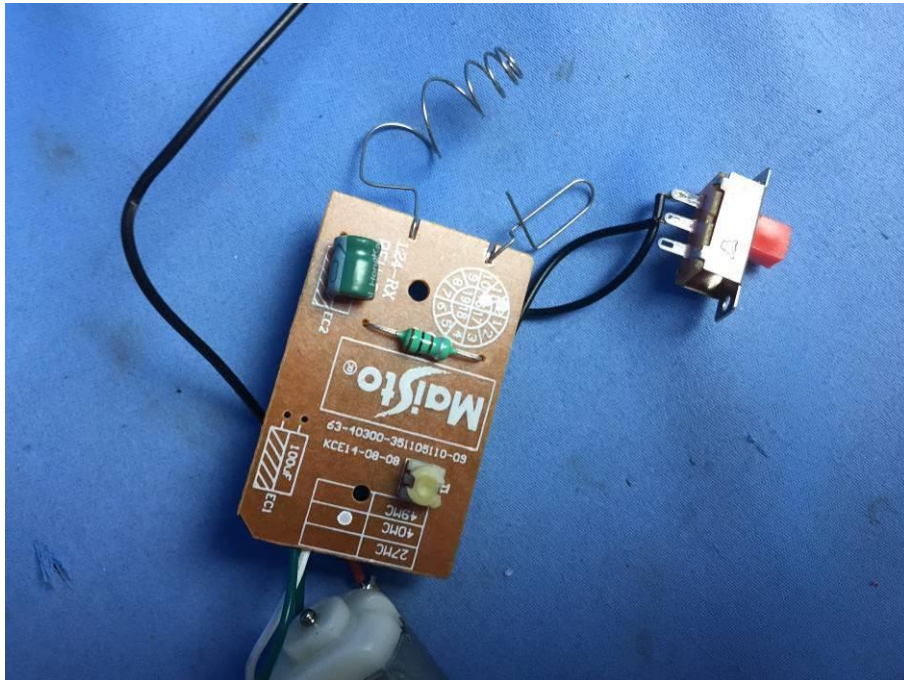
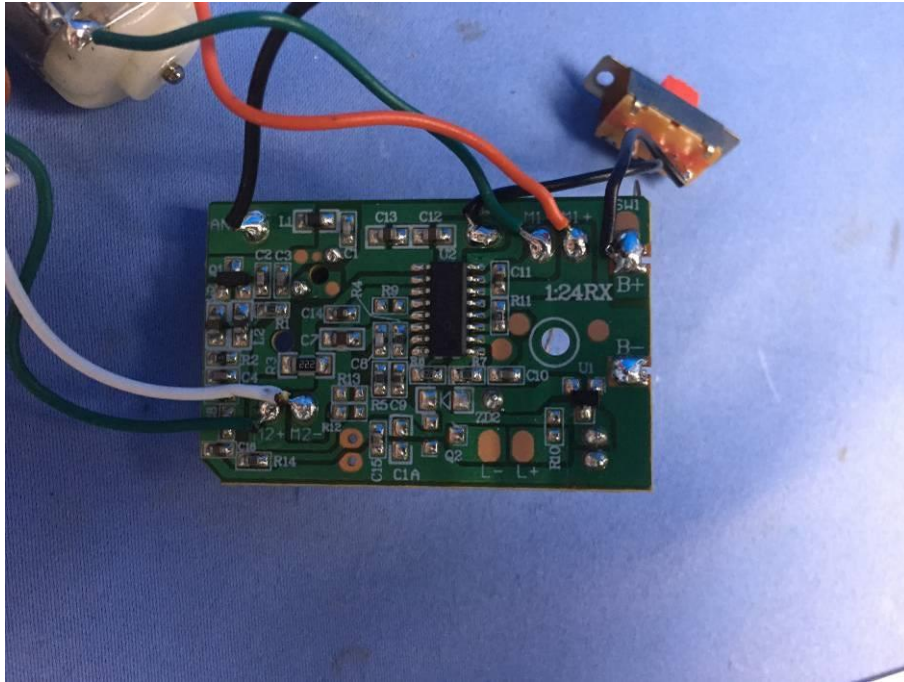
INTERNAL PHOTO (TX)



INTERNAL PHOTO (RX)



INTERNAL PHOTO (RX)



INTERNAL PHOTO (RX)



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