


TEST REPORT No.: (5221)257-0744(A)

TEST REPORT

To :	SILVERLIT TOYS MANUFACTORY LTD.	Fax :	--
Attn :	Mr Edmond Chan / Mr Martin chim	Email :	Edmond@silverlit.com ; yatlung@silverlit.com ; wt.angelzhang@silverlit.com
Address :	RM 1102, EAST OCEAN CENTER, 98 GRANVILLE ROAD, TSIM SHA TSUI, KOWLOON, HONG KONG		
Cc :	--	Fax/Email:	--
Attn :	--		
Folder No.:	--	Date of Receipt:	2021-09-18
		Test date :	2021-09-18 to 2021-10-12

MANUFACTURER OR SUPPLIER NAME :	--	
MANUFACTURER OR SUPPLIER ADDRESS :	--	
PRODUCT :	X-CRAWLER	
MODEL REFERENCE :	20634	
ADDITIONAL MODEL & MODEL DIFFERENCE :	SK17048; see items 1.1	
RATED VOLTAGE :	Car: 3.7Vd.c. ("Rechargeable battery" x 1) Remote: 3Vd.c. ("AA" size battery x 2)	
REMARKS :	--	
SAMPLE NO. :	(5221)257-0744	

The submitted sample of the above equipment has been tested according to the requirements of the following standards:

ETSI EN 301 489-1 V2.2.3 (2019-11)
ETSI EN 301 489-3 V2.1.1 (2019-03)

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Assistant Manager,
EMC Department



Name: Sze Tsz Man
Date: December 02, 2021



TEST REPORT No.: (5221)257-0744(A)

TABLE OF CONTENTS

RELEASE CONTROL RECORD.....	3
1 SUMMARY OF TEST RESULTS.....	4
1.1 MEASUREMENT UNCERTAINTY.....	4
2 GENERAL INFORMATION.....	6
2.1 GENERAL DESCRIPTION OF EUT.....	6
2.2 DESCRIPTION OF TEST MODE.....	7
2.3 GENERAL DESCRIPTION OF APPLIED STANDARD.....	8
2.4 DESCRIPTION OF SUPPORT UNIT.....	8
3 EMISSION TEST.....	9
3.1 RADIATED EMISSION MEASUREMENT.....	9
3.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT.....	9
3.1.2 TEST INSTRUMENTS.....	11
3.1.3 TEST PROCEDURE.....	12
3.1.4 DEVIATION FROM TEST STANDARD.....	13
3.1.5 TEST SETUP.....	14
3.1.6 TEST RESULTS.....	15
3.1.7 TEST RESULTS (ABOVE 1GHZ).....	19
4 IMMUNITY TEST.....	20
4.1 GENERAL DESCRIPTION.....	20
4.2 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD).....	21
4.2.1 TEST SPECIFICATION.....	21
4.2.2 TEST INSTRUMENT.....	21
4.2.3 TEST PROCEDURE.....	22
4.2.4 DEVIATION FROM TEST STANDARD.....	22
4.2.5 TEST SETUP.....	23
4.2.6 TEST RESULTS.....	24
4.3 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS).....	25
4.3.1 TEST SPECIFICATION.....	29
4.3.2 TEST INSTRUMENT.....	29
4.3.3 TEST PROCEDURE.....	31
4.3.4 DEVIATION FROM TEST STANDARD.....	31
4.3.5 TEST SETUP.....	32
4.3.6 TEST RESULTS.....	33
5 PHOTOGRAPHS OF THE TEST CONFIGURATION.....	34
6 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	36



TEST REPORT No.: (5221)257-0744(A)

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RM2109WDG0212	Original Release	Oct. 18, 2021



TEST REPORT No.: (5221)257-0744(A)

1 SUMMARY OF TEST RESULTS

After estimating all the combination of every test mode, the result shown as below is the worst case.

The EUT has been tested according to the following specifications.

EMISSION			
Standard	Test Type	Result	Remarks
EN 55032:2015	Radiated test (30MHz~1GHz)	PASS	Meets limits minimum passing margin is -3.29dB at 663.90MHz
	Radiated test (Above 1GHz)	PASS	Meets limits minimum passing margin is -12.60dB at 1947.00MHz

IMMUNITY			
Standard	Test Type	Result	Remarks
EN 61000-4-2:2009	Electrostatic discharge immunity test	PASS	Meets the requirements of Performance Criterion A
EN IEC61000-4-3: 2020 ED.4.0	Radiated, radio-frequency, electromagnetic field immunity test	PASS	Meets the requirements of Performance Criterion A

1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.



TEST REPORT No.: (5221)257-0744(A)

Measurement	Frequency	Uncertainty
Radiated emissions	30MHz~1GHz	+/-4.00 dB
	1GHz-6GHz	+/-5.17dB



TEST REPORT No.: (5221)257-0744(A)

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	X-CRAWLER
MODEL NO.	20634
ADDITIONAL MODEL	SK17048
POWER SUPPLY	Remote Control(TX): DC 3V (1.5V*AA*2) from Battery; Car(RX): DC 3.7V from Li-ion Battery; Battery Charger: DC 5V from USB Host Unit
MODULATION TYPE	GFSK
RANGE OF FREQUENCY	2417-2470MHz
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	USB Line: Unshielded, Detachable, 0.5m

NOTES:

1. For a more detailed features description, please refer to the product specifications or the User's Manual.
2. For the test results, the EUT had been tested with all conditions, and only the worst case was shown in this test report.
3. Please refer to the EUT photo document (Reference No.: 2109WDG0212) for detailed product photo.
4. Additional model SK17048 is identical with the test model 20634 except the appearance and model number for trading purpose.



TEST REPORT No.: (5221)257-0744(A)

2.2 DESCRIPTION OF TEST MODE

The EUT were tested under the following mode, the final worst mode were marked in boldface and recorded in this report.

◆ FOR RADIATED EMISSIONS TEST (Below 1GHz):

Test Mode	Test Voltage
TX RX Link Normal Working	TX: DC 3V from Battery RX: DC 3.7V from Li-ion Battery
Standby	
Transmitting	
Receiving	

◆ FOR RADIATED EMISSIONS TEST (Above 1GHz):

Test Mode	Test Voltage
TX RX Link Normal Working	TX: DC 3V from Battery RX: DC 3.7V from Li-ion Battery

◆ FOR IMMUNITY TESTS:

Test Mode	Test Voltage
TX RX Link Normal Working	TX: DC 3V from Battery RX: DC 3.7V from Li-ion Battery
Standby	
Transmitting	
Receiving	



TEST REPORT No.: (5221)257-0744(A)

2.3 GENERAL DESCRIPTION OF APPLIED STANDARD

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

EN 301 489-1 V2.2.3 (2019-11)

EN 301 489-3 V2.1.1 (2019-03)

EN 55032:2015

EN 61000-4-2:2009

EN IEC 61000-4-3:2020 ED.4.0

Note: The above EN basic standards are applied with latest version if customer has no special requirement.

Due to the EUT is powered by Battery, there was no need for the Conducted, Harmonics, Flicker, EFT, Surge, CS and Dips tests.

2.4 DESCRIPTION OF SUPPORT UNIT

The EUT has been tested as a dependent unit together without any other necessary accessories or support units.



TEST REPORT No.: (5221)257-0744(A)

3 EMISSION TEST

3.1 Radiated Emission Measurement

3.1.1 Limits of Radiated Emission Measurement

TEST STANDARD: EN 55032

FOR FREQUENCY BELOW 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	Quasi-Peak (dBuV/m)	Quasi-Peak (dBuV/m)
30 – 230	40	30
230 – 1000	47	37

FREQUENCY (MHz)	Class A (at 3m)	Class B (at 3m)
	Quasi-Peak (dBuV/m)	Quasi-Peak (dBuV/m)
30 – 230	50	40
230 – 1000	57	47

For FM receivers

Distance (m)	Source	Frequency Range (MHz)	Limits dB (uV/m)	
			Quasi-peak	
10	Local oscillator	≤1000	Fundamental	50
		30 to 300	Harmonics	42
		300 to 1000	Harmonics	46
	Other	30 to 230		30
		230 to 1000		37
3	Local oscillator	≤1000	Fundamental	60
		30 to 300	Harmonics	52
		300 to 1000	Harmonics	56
	Other	30 to 230		40
		230 to 1000		47



TEST REPORT No.: (5221)257-0744(A)

**FREQUENCY RANGE OF RADIATED MEASUREMENT
(For unintentional radiators)**

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	Up to 5 times of the highest frequency or 6 GHz, whichever is less

FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (GHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
1 to 3	76	56	70	50
3 to 6	80	60	74	54

- NOTES:** (1) The lower limit shall apply at the transition frequencies.
 (2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
 (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



TEST REPORT No.: (5221)257-0744(A)

3.1.2 Test Instruments

FREQUENCY RANGE BELOW 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU26	100005	Apr. 17, 22
EMI Test Receiver	Rohde&Schwarz	ESR7	101564	Mar. 07, 22
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-555	Dec. 11, 21
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-554	Jan. 09, 22
Preamplifier	EMCI	EMC1135	980378	Mar. 13, 22
Preamplifier	EMCI	EMC1135	980423	Mar. 13, 22
10m Semi-anechoic Chamber	CHANGLING	21.4m*12.1m*8.8m	NSEMC006	May 23, 22
Test Software	ADT	ADT_Radiated_V8.7.07	N/A	N/A

- NOTES:** 1. The test was performed in 10m Chamber.
 2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

FREQUENCY RANGE ABOVE 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Horn Antenna	ETS-Lindgren	3117	00085519	Nov. 06, 21
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170147	May 04, 22
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101003	Feb. 24, 22
Broadband Preamplifier (1~18GHz)	Rohde&Schwarz	SCU18	102265	Jun, 21, 22
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Jan. 10, 22
Test Software	ADT	ADT_Radiated_V8.7.07	N/A	N/A

- NOTES:** 1. The test was performed in 10m Chamber.
 2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



TEST REPORT No.: (5221)257-0744(A)

3.1.3 Test Procedure

<Frequency Range below 1GHz>

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.

NOTES:

1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
3. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) (if the raw value not contains the amplifier);
4. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain(dB) (if the raw value contains the amplifier).
5. Margin value = Emission level – Limit value.



TEST REPORT No.: (5221)257-0744(A)

<Frequency Range above 1GHz>

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna can be varied from one meter-to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. The bore sight should be used during the test above 1GHz. The bore sight should be used during the test above 1GHz.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test receiver/spectrum was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

NOTES:

1. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.
2. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the receiver antenna.
3. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
4. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) (if the raw value not contains the amplifier);
5. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain(dB) (if the raw value contains the amplifier).
6. Margin value = Emission level – Limit value.

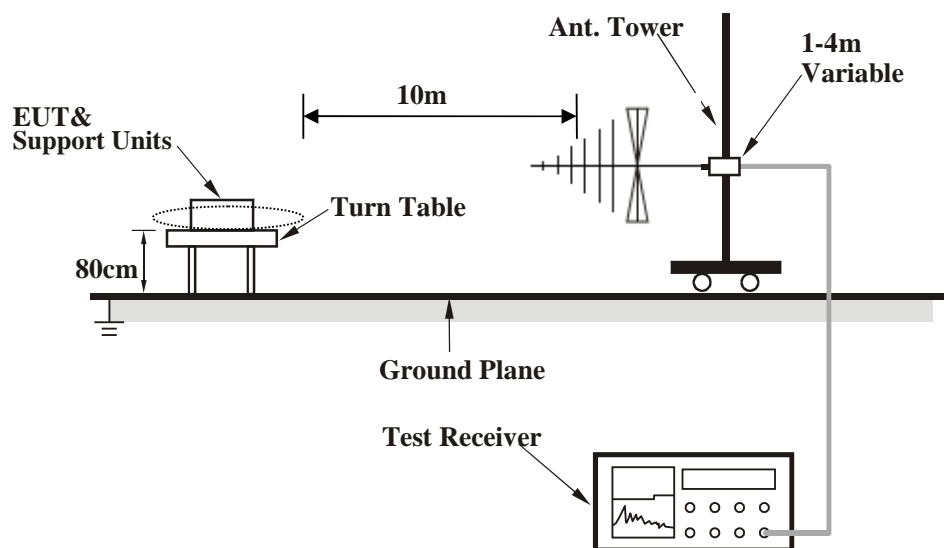
3.1.4 DEVIATION FROM TEST STANDARD

No deviation.

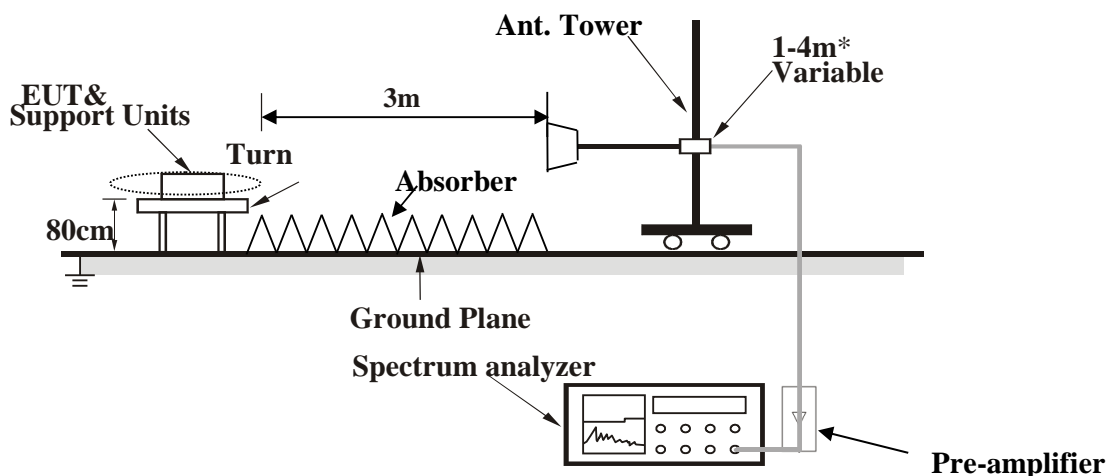
TEST REPORT No.: (5221)257-0744(A)

3.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



*: depends on the EUT height and the antenna 3dB beam width both, refer to section 7.3 of CISPR 16-2-3



TEST REPORT No.: (5221)257-0744(A)

3.1.6 Test Results

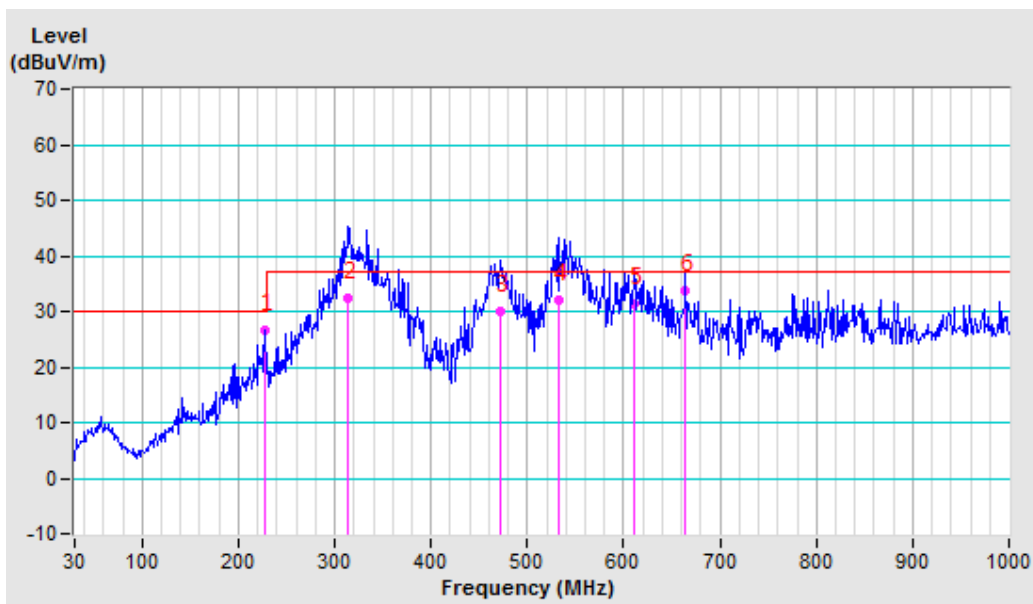
TEST MODE	See section 2.2	FREQUENCY RANGE	30-1000 MHz
TEST VOLTAGE	See section 2.2	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	21deg. C, 54%RH	TESTED BY: Ray	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	227.15	-22.22	48.86	26.64	30.00	-3.36	200	120
2	314.33	-19.04	51.33	32.29	37.00	-4.71	400	1
3	472.68	-15.01	45.16	30.15	37.00	-6.85	200	163
4	532.10	-14.01	46.21	32.20	37.00	-4.80	200	349
5	610.91	-11.96	43.26	31.30	37.00	-5.70	200	346
6	663.90	-11.19	44.90	33.71	37.00	-3.29	200	179

- REMARKS:**
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.



TEST REPORT No.: (5221)257-0744(A)





TEST REPORT No.: (5221)257-0744(A)

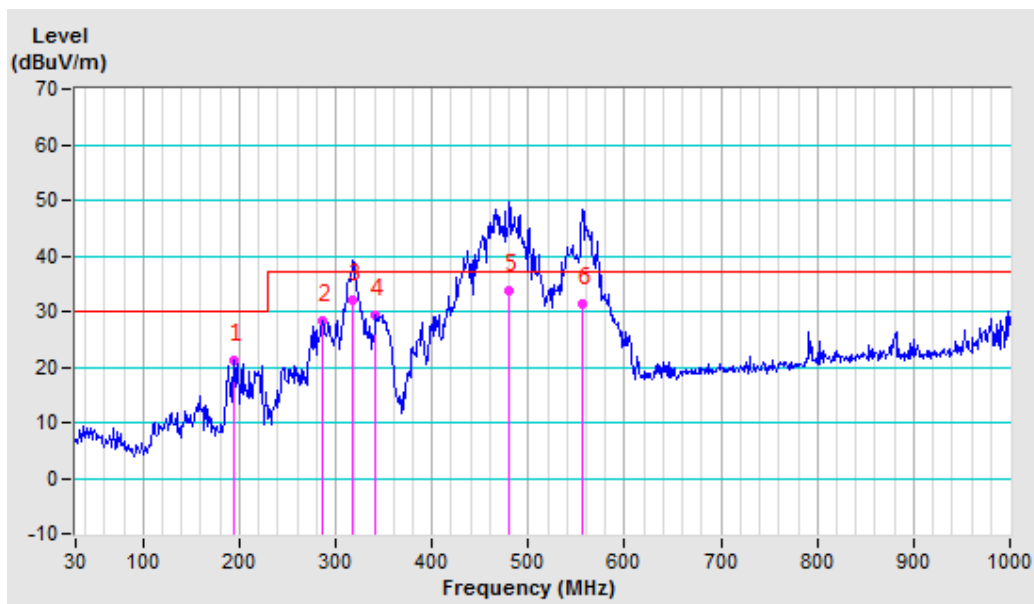
TEST MODE	See section 2.2	FREQUENCY RANGE	30-1000 MHz
TEST VOLTAGE	See section 2.2	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	21deg. C, 54%RH	TESTED BY: Ray	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	194.91	-23.57	44.79	21.22	30.00	-8.78	100	351
2	287.01	-19.89	48.25	28.36	37.00	-8.64	100	36
3	318.35	-18.98	51.04	32.06	37.00	-4.94	100	242
4	341.43	-18.51	47.78	29.27	37.00	-7.73	100	166
5	480.54	-14.95	48.63	33.68	37.00	-3.32	100	217
6	555.62	-13.59	44.95	31.36	37.00	-5.64	100	146

- REMARKS:**
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.



TEST REPORT No.: (5221)257-0744(A)





TEST REPORT No.: (5221)257-0744(A)

3.1.7 Test Results (ABOVE 1GHz)

TEST MODE	See section 2.2		
TEST VOLTAGE	See section 2.2	FREQUENCY RANGE	1-6 GHz
ENVIRONMENTAL CONDITIONS	23deg. C, 55%RH	TESTED BY: Ray	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	1947.00PK	-10.73	67.53	56.80	70.00	-13.20	100	299
2	1947.00AV	-10.73	48.13	37.40	50.00	-12.60	100	299
3	3266.00PK	-7.42	64.72	57.30	74.00	-16.70	100	107
4	3266.00AV	-7.42	45.32	37.90	54.00	-16.10	100	107
5	5492.00PK	-2.89	60.49	57.60	74.00	-16.40	100	266
6	5492.00AV	-2.89	41.39	38.50	54.00	-15.50	100	266
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	1977.00PK	-11.29	68.09	56.80	70.00	-13.20	100	271
2	1977.00AV	-11.29	48.69	37.40	50.00	-12.60	100	271
3	3156.00PK	-8.81	66.01	57.20	74.00	-16.80	100	166
4	3156.00AV	-8.81	46.41	37.60	54.00	-16.40	100	166
5	4992.00PK	-6.13	63.93	57.80	74.00	-16.20	100	216
6	4992.00AV	-6.13	44.63	38.50	54.00	-15.50	100	216

- REMARKS:**
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: 1GHz to 6GHz.
 4. Only emissions significantly above equipment noise floor are reported.

BUREAU VERITAS HONG KONG LIMITED –
Kowloon Bay Office
 1/F Pacific Trade Centre,
 2 Kai Hing Road, Kowloon Bay,
 Kowloon, HONG KONG
 Tel: +852 2331 0888
 Fax: +852 2331 0889
 www.cps.bureauveritas.com

This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions> and 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. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the 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 based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that 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.



TEST REPORT No.: (5221)257-0744(A)

4 IMMUNITY TEST

4.1 GENERAL DESCRIPTION

Product Standard	EN 301 489-1 V2.2.3 (2019-11) EN 301 489-3 V2.1.1 (2019-03)	
Basic Standard, Specification, and Performance Criterion required	EN 61000-4-2	Electrostatic Discharge – ESD: 8 kV air discharge, 4 kV Contact discharge, Performance Criterion B
	EN IEC 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80~6000 MHz, 3 V/m, 80% AM (1 kHz), Performance Criterion A

For EN 301 489-3

The phenomena allowed during and after test in each criterion are clearly stated in the following table.

Performance criteria		
Criteria	During test	After test
A	Operate as intended No loss of function No unintentional responses	Operate as intended No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May show loss of function No unintentional responses	Operate as intended Loss of function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions



TEST REPORT No.: (5221)257-0744(A)

4.2 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

4.2.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Discharge Voltage:	Air Discharge: 8 kV (Direct) Contact Discharge: 4 kV (Direct and Indirect)
Polarity:	Positive & Negative
Number of Discharge:	20 times on each test points
Discharge Mode:	Single Discharge
Discharge Period:	1 second

4.2.2 TEST INSTRUMENT

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
ESD Generator	TESEQ	NSG 437	279	Mar. 03, 22
Test Software	TESEQ	V03.03	N/A	N/A
ESD Generator	EM TEST	Dito	V1211112265	Nov. 29, 21
Test Software	EM TEST	V 2.31	N/A	N/A

- NOTES:** 1. The test was performed in ESD Room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



TEST REPORT No.: (5221)257-0744(A)

4.2.3 TEST PROCEDURE

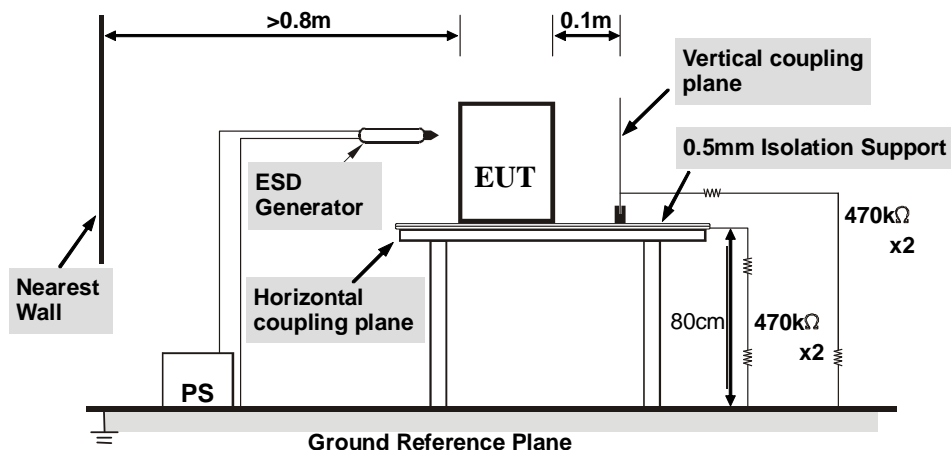
- a. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.
- b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- c. The time interval between two successive single discharges was at least 1 second.
- d. The discharge return cable of the generator shall be kept at a distance of at least 0.2 m from the EUT whilst the discharge is being applied and should not be held by the operator.
- e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.
- g. At least ten single discharges (in the most sensitive polarity) were applied to the **Horizontal Coupling Plane** at points on each side of the EUT. The ESD generator was positioned horizontally at a distance of 0.1 meters from the EUT with the discharge electrode touching the **HCP**.
- h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the **Vertical Coupling Plane** in sufficiently different positions that the four faces of the EUT were completely illuminated. The **VCP** (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

TEST REPORT No.: (5221)257-0744(A)

4.2.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

NOTE:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the **Ground Reference Plane**. The **GRP** consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A **Horizontal Coupling Plane** (1.6m x 0.8m) was placed on the table and attached to the **GRP** by means of a cable with 940kΩ total impedance. The equipment under test, was installed in a representative system as described in section 7 of EN 61000-4-2 and its cables were placed on the **HCP** and isolated by an insulating support of 0.5mm thickness. A distance of 0.8 minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.



TEST REPORT No.: (5221)257-0744(A)

4.2.6 TEST RESULTS

TEST VOLTAGE	See section 2.2	ENVIRONMENTAL CONDITIONS	23.1deg. C, 48.3% RH, 101.2kPa
TESTED BY	Zhuolin Peng		

Direct Discharge Application				
Test Level (kV)	Polarity	Test Point	Test Result of Contact Discharge	Test Result of Air Discharge
4	+ / -	All metal parts	A	N/A
8	+ / -	All non-metal parts	N/A	A

Indirect Discharge Application				
Discharge Level (kV)	Polarity	Test Point	Test Result of HCP	Test Result of VCP
4	+ / -	HCP	A	N/A
4	+ / -	VCP	N/A	A

NOTE: A: There was no change compared with initial operation during the test.



**BUREAU
VERITAS**

TEST REPORT No.: (5221)257-0744(A)

ESD TEST POINT

⓪ - Direct Contact Discharge; ✦ (Air Discharge)



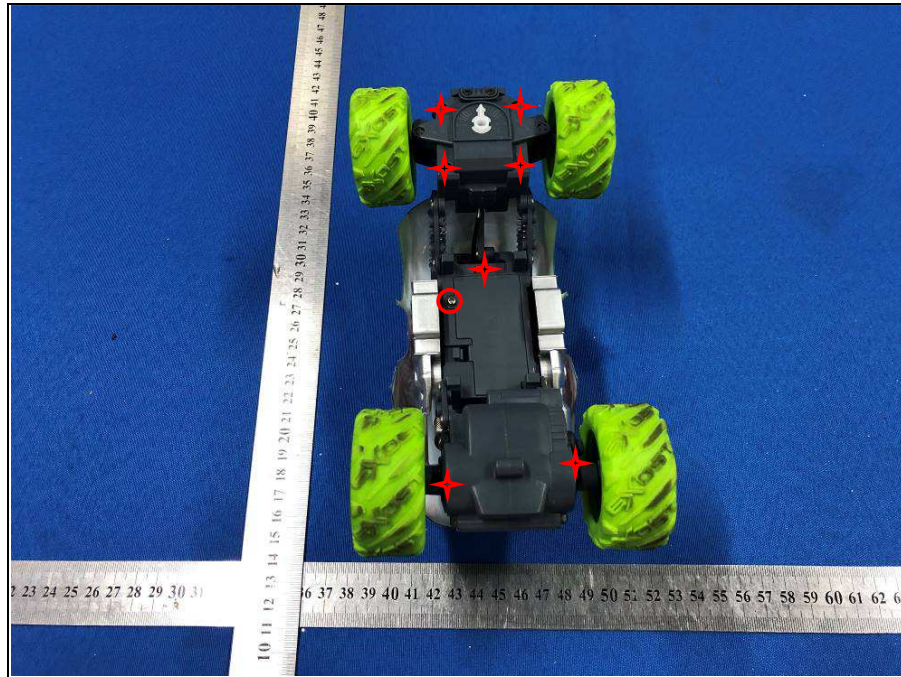
**BUREAU VERITAS HONG KONG LIMITED –
Kowloon Bay Office
1/F Pacific Trade Centre,
2 Kai Hing Road, Kowloon Bay,
Kowloon, HONG KONG**
Tel: +852 2331 0888
Fax: +852 2331 0889
www.cps.bureauveritas.com

This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions> and 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. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the 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 based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that 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.



**BUREAU
VERITAS**

TEST REPORT No.: (5221)257-0744(A)



TEST REPORT No.: (5221)257-0744(A)



TEST REPORT No.: (5221)257-0744(A)





TEST REPORT No.: (5221)257-0744(A)

4.3 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)

4.3.1 TEST SPECIFICATION

Basic Standard:	EN IEC 61000-4-3
Frequency Range:	80 MHz ~ 6000 MHz
Field Strength:	3 V/m
Modulation:	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1% of preceding frequency value
Polarity of Antenna:	Horizontal and Vertical
Antenna Height:	1.5 m
Dwell Time:	3 seconds

4.3.2 TEST INSTRUMENT

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Signal Generator	Agilent	N5181A	MY501425 30	Aug. 19,22
Antenna Log-Periodic	AR	ATR80M6G	0337307	N/A
Antenna Log-Periodic	AR	ATS700M11G	0336821	N/A
Switch Controller	AR	SC1000	0337343	N/A
RF Power Meter	Boonton	4242	13984	Sep. 14,22
Power Sensor	Keysight	U2021XA	MY550600 16	N/A
Power Sensor	Boonton	51011EMC	35715	Aug. 19, 22
E-Field probe	Narda	NBM-520	2403/01B	Nov. 11,21
E-Field probe	Narda	EP601	8112X0109 9	Jul. 13, 22
Power Amplifier	TESEQ	CBA 1G-150	T44029	N/A
Power Amplifier	TESEQ	CBA 3G-100	T44030	N/A
Power Amplifier	TESEQ	CBA 6G-050	1041204	N/A
Dual Directional Coupler	TESEQ	C5982	95208	Aug. 19, 22
Dual Directional	TESEQ	C6187	95175	Aug. 19, 22



TEST REPORT No.: (5221)257-0744(A)

Coupler				
Dual Directional Coupler	TESEQ	CPH-274F	M251304-01	Aug. 19, 22
Audio analyzer	Rohde&Schwarz	UPV	101397	Aug. 19, 22
Conditioning Amplifier	B&K	2690-W-013	3241205	Mar. 18,22
EAR SIMULATOR	B&K	4192	2764719	May 18, 22
Test Software	Tonscend	TS+	2.0.1.8	N/A
Test Software	ADT	BVADT_RS_V7.6.4-DG	N/A	N/A

- NOTES:** 1. The test was performed in RS chamber.
 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



TEST REPORT No.: (5221)257-0744(A)

4.3.3 TEST PROCEDURE

The test procedure was in accordance with EN IEC 61000-4-3.

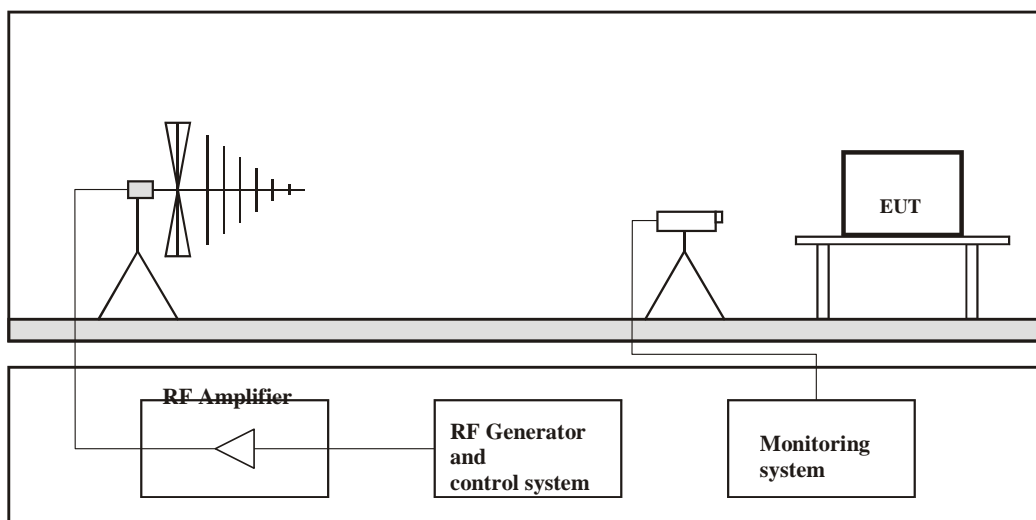
- a. The testing was performed in a fully-anechoic chamber.
- b. The frequency range is swept from 80 MHz to 6000 MHz with the signal 80% amplitude modulated with a 1 kHz sine wave.
- c. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5s.
- d. The field strength level was 3 V/m.
- e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

TEST REPORT No.: (5221)257-0744(A)

4.3.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

NOTE:

TABLETOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.



TEST REPORT No.: (5221)257-0744(A)

4.3.6 TEST RESULTS

TEST VOLTAGE	See section 2.2	ENVIRONMENTAL CONDITIONS	23.5 deg. C, 51.8% RH
TESTED BY	Ming Bai		

Field Strength (V/m)	Test Frequency Note ^{#1} (MHz)	Polarization of antenna (Horizontal / Vertical)	Test Distance (m)	Test Result	Remark
3	80-6000	H / V	3	A	N/A

Note^{#1}: Tested Israel SII Frequencies

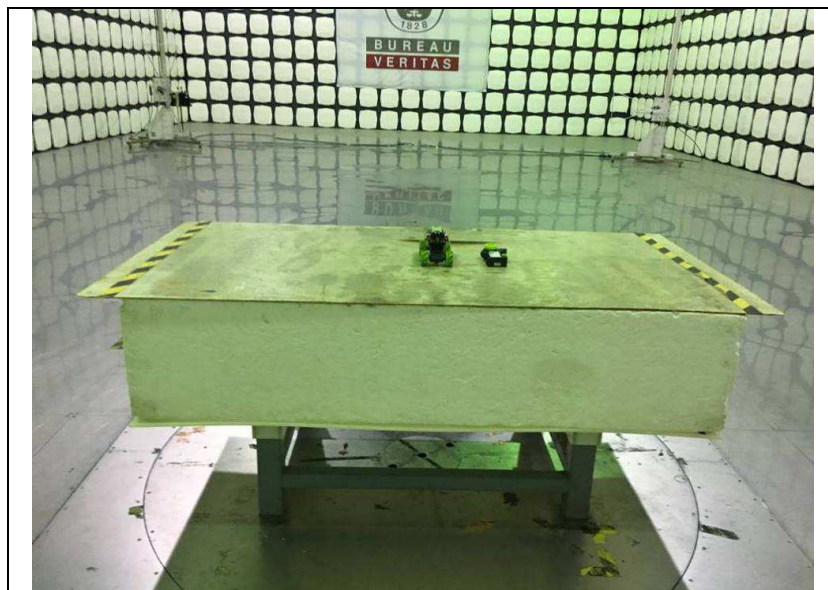
89,100,107,144,163,196,244,315,434,460,600,825,845,880 MHz

NOTE: A: There was no change compared with initial operation during the test.

TEST REPORT No.: (5221)257-0744(A)

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

RADIATED EMISSION TEST < 30MHz~1GHz>



RADIATED EMISSION TEST < Above 1GHz>

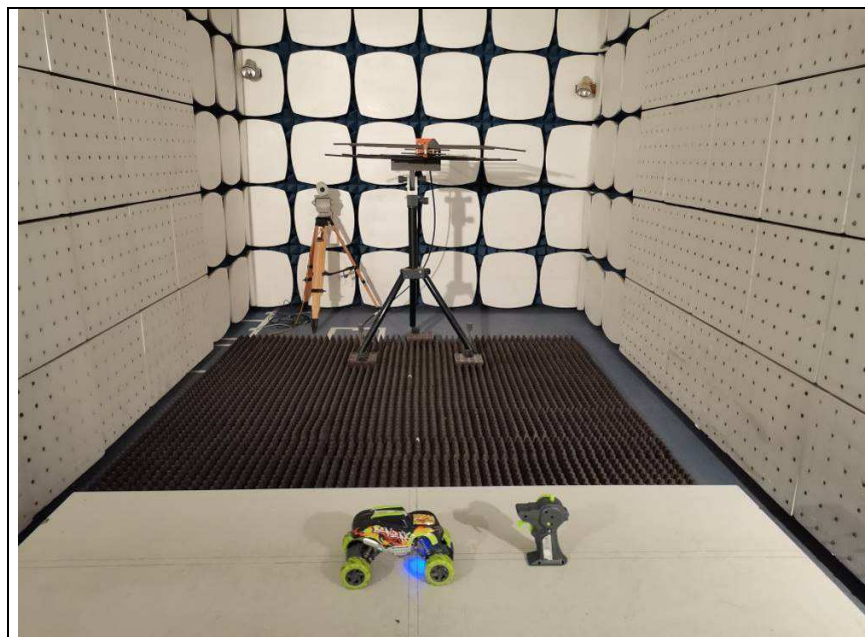


TEST REPORT No.: (5221)257-0744(A)

ESD TEST



R/S TEST





TEST REPORT No.: (5221)257-0744(A)

6 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications were made to the EUT by the lab during the test.

---END---