

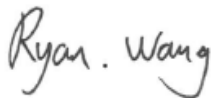
# CE EMC Test Report

**Project No.** : 1912H030  
**Equipment** : Children ride on toys  
**Brand Name** : N/A  
**Test Model** : TR1905  
**Series Model** : N/A  
**Applicant** : Jinjianfeng Group Pinghu Children Tricycle Co.,Ltd  
**Address** : North of Babycar Road, Xincang Town, Pinghu City, ZheJiang. China  
**Factory** : Jinjianfeng Group Pinghu Children Tricycle Co.,Ltd  
**Address** : North of Babycar Road, Xincang Town, Pinghu City, ZheJiang. China  
**Date of Receipt** : Dec. 17, 2019  
**Date of Test** : Dec. 17, 2019 ~ Jan. 12, 2020  
**Issued Date** : Jan. 21, 2020  
**Report Version** : R00  
**Test Sample** : Engineering Sample No.: SH20191217127, SH2019123143  
**Standard(s)** : EN 55014-1:2017  
EN 55014-2:2015  
EN 61000-3-2:2014  
EN 61000-3-3:2013

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.



**Prepared by** : Antonio long



**Approved by** : Ryan Wang



Certificate #5123.03

Add: No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China.

Tel: +86-021-61765666

Web: [www.newbtl.com](http://www.newbtl.com)

**Declaration**

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

**BTL's** reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

**BTL's** laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

**BTL** is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

**Limitation**

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

<b>Table of Contents</b>	<b>Page</b>
<b>REPORT ISSUED HISTORY</b>	<b>6</b>
<b>1 . SUMMARY OF TEST RESULTS</b>	<b>7</b>
1.1 TEST FACILITY	8
1.2 MEASUREMENT UNCERTAINTY	8
1.3 TEST ENVIRONMENT CONDITIONS	10
<b>2 . GENERAL INFORMATION</b>	<b>11</b>
2.1 GENERAL DESCRIPTION OF EUT	11
2.2 DESCRIPTION OF TEST MODES	12
2.3 EUT OPERATING CONDITIONS	13
2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	13
2.5 DESCRIPTION OF SUPPORT UNITS	14
<b>3 . EMC EMISSION TEST</b>	<b>15</b>
3.1 TERMINAL DISTURBANCE VOLTAGES TEST	15
3.1.1 LIMITS	15
3.1.2 TEST PROCEDURE	16
3.1.3 DEVIATION FROM TEST STANDARD	16
3.1.4 TEST SETUP	16
CONTINUOUS DISTURBANCE VOLTAGE/CURRENT FOR MAINS PORT	16
3.1.5 TEST RESULTS	16
3.2 RADIATED DISTURBANCES TEST	17
3.2.1 LIMITS	17
3.2.2 TEST PROCEDURE	18
3.2.3 DEVIATION FROM TEST STANDARD	18
3.2.4 TEST SETUP	18
3.2.5 MEASUREMENT DISTANCE	19
3.2.6 TEST RESULTS	19
3.3 HARMONIC CURRENT EMISSIONS TEST	20
3.3.1 LIMITS	20
3.3.2 TEST PROCEDURE	20
3.3.3 DEVIATION FROM TEST STANDARD	20
3.3.4 TEST SETUP	21
3.3.5 TEST RESULTS	21
3.4 VOLTAGE CHANGES, VOLTAGE FLUCTUATIONS AND FLICKER TEST	22
3.4.1 LIMITS	22
3.4.2 TEST PROCEDURE	22
3.4.3 DEVIATION FROM TEST STANDARD	22
3.4.4 TESTSETUP	22
3.4.5 TEST RESULTS	22

<b>Table of Contents</b>	<b>Page</b>
<b>4 . EMC IMMUNITY TEST</b>	<b>23</b>
<b>4.1 APPLICABILITY OF TEST ITEMS</b>	<b>23</b>
<b>4.2 STANDARD COMPLIANCE/SERVRITY LEVEL/CRITERIA</b>	<b>24</b>
<b>4.3 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)</b>	<b>25</b>
4.3.1 TEST SPECIFICATION	25
4.3.2 TEST PROCEDURE	25
4.3.3 DEVIATION FROM TEST STANDARD	26
4.3.4 TEST SETUP	26
4.3.5 TEST RESULTS	26
<b>4.4 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)</b>	<b>27</b>
4.4.1 TEST SPECIFICATION	27
4.4.2 TEST PROCEDURE	27
4.4.3 DEVIATION FROM TEST STANDARD	27
4.4.4 TEST SETUP	28
4.4.5 TEST RESULTS	28
<b>4.5 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT/BURST)</b>	<b>29</b>
4.5.1 TEST SPECIFICATION	29
4.5.2 TEST PROCEDURE	29
4.5.3 DEVIATION FROM TEST STANDARD	29
4.5.4 TEST SETUP	29
4.5.5 TEST RESULTS	29
<b>4.6 SURGE IMMUNITY TEST</b>	<b>30</b>
4.6.1 TEST SPECIFICATION	30
4.6.2 TEST PROCEDURE	30
4.6.3 DEVIATION FROM TEST STANDARD	31
4.6.4 TEST SETUP	31
4.6.5 TEST RESULTS	31
<b>4.7 IMMUNITY TO CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELDS TEST (CS)</b>	<b>32</b>
4.7.1 TEST SPECIFICATION	32
4.7.2 TEST PROCEDURE	32
4.7.3 DEVIATION FROM TEST STANDARD	32
4.7.4 TEST SETUP	32
4.7.5 TEST RESULTS	32
<b>4.8 VOLTAGE DIPS IMMUNITY TEST</b>	<b>33</b>
4.8.1 TEST SPECIFICATION	33
4.8.2 TEST PROCEDURE	33
4.8.3 DEVIATION FROM TEST STANDARD	33
4.8.4 TEST SETUP	33
4.8.5 TEST RESULTS	33

<b>Table of Contents</b>	<b>Page</b>
<b>5 . MEASUREMENT INSTRUMENTS LIST</b>	<b>34</b>
<b>6 . EUT TEST PHOTO</b>	<b>37</b>
<b>APPENDIX A - CONTINUOUS DISTURBANCE VOLTAGE/CURRENT</b>	<b>39</b>
<b>APPENDIX B - RADIATED DISTURBANCES</b>	<b>42</b>
<b>APPENDIX C - HARMONICS CURRENT</b>	<b>49</b>
<b>APPENDIX D - VOLTAGE FLUCTUATION AND FLICKER</b>	<b>53</b>
<b>APPENDIX E - ESD</b>	<b>55</b>
<b>APPENDIX F - RS</b>	<b>61</b>
<b>APPENDIX G - EFT/BURST</b>	<b>63</b>
<b>APPENDIX H - SURGE</b>	<b>65</b>
<b>APPENDIX I - INJECTION CURRENT</b>	<b>67</b>
<b>APPENDIX J - VOLTAGE INTERRUPTION/DIPS</b>	<b>69</b>

**REPORT ISSUED HISTORY**

Report Version	Description	Issued Date
R00	Original Issue.	Jan. 21, 2020

## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Emission				
Standard	Test Item		Judgment	
EN 55014-1:2017	Continuous Disturbance voltage/current	Mains ports	PASS	
		N/A	Voltage	N/A
			Current	N/A
		Wired network ports	N/A	
	Discontinuous disturbances	Clicks	N/A	
	Disturbance power		N/A	
Radiated disturbances		PASS		

Standard	Test Item	Judgment
EN 61000-3-2:2014	Harmonic current emissions	PASS
EN 61000-3-3:2013	Voltage changes, voltage fluctuations and flicker	PASS

Immunity			
Standard(s)	Ref Standard(s)	Test Item	Result
EN 55014-2:2015	IEC 61000-4-2:2008	ESD	PASS
	IEC 61000-4-3: 2006+A1:2007+A2:2010	RS	PASS
	IEC 61000-4-4:2012	EFT	PASS
	IEC 61000-4-5:2014+A1:2017	Surge	PASS
	IEC 61000-4-6:2013	CS	PASS
	IEC 61000-4-11:2004+A1:2017	Dips	PASS

**NOTE:**

(1) "N/A" denotes test is not applicable in this Test Report.

## 1.1 TEST FACILITY

The test facilities used to collect the test data in this report is located at the location of No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China.

## 1.2 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, The BTL measurement uncertainty is less than the CISPR 16-4-2  $U_{\text{CISPR}}$  requirement.

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately **95%**.

### A. Continuous Disturbance voltage/current Measurement:

Test Site	Method	Measurement Frequency Range	U , (dB)
SH-C01	CISPR	9 kHz ~ 150 MHz	2.92
		150 kHz ~ 30 MHz	2.40

### B. Radiated disturbances Measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)
SH-CB01 (3m)	CISPR	30MHz ~ 200MHz	V	3.86
		30MHz ~ 200MHz	H	2.88
		200MHz ~ 1,000MHz	V	3.88
		200MHz ~ 1,000MHz	H	3.70

### C. Harmonic current / Voltage fluctuations (Flicker) measurement:

Test Site	Method	Test item	U(%)
SH-SR03	IEC 61000-3-2	Voltage	0.600
	IEC 61000-3-3	Current	0.593



## D. Immunity Measurement:

SH-SR01	IEC 61000-4-2	Rise time tr	5.0%
		Peak current Ip	4.8%
		Current at 30 ns	4.8%
		Current at 60 ns	4.8%
SH-CB12	IEC 61000-4-3	Electromagnetic field immunity test	1.76dB
		On-ear acoustic & Acoustic measurements on loudspeakers	1.78dB
		For electrical measurements / For measuring the demodulation on analogue wired network lines	1.76dB
		Audio breakthrough measurement for RS 2G/3G	1.86dB
		Audio breakthrough measurement for RS 4G	2.00dB
SH-SR02	IEC 61000-4-4	voltage peak value(VP)	5.0%
		voltage rise time (tr)	4.0%
		voltage pulse width(tw)	4.0%
		Pulse Freq.(kHz)	4.0%
		Burst Duration(ms)	4.0%
		Burst Period(ms)	4.0%
		voltage peak value(VP)-with clamp	5.0%
		voltage rise time (tr) -with clamp	5.0%
SH-SR02	IEC 61000-4-5	Open-Circuit Output Voltage	5.0%
		Open-Circuit front time	4.0%
		Open-Circuit time of half value	4.0%
SH-SR03	IEC 61000-4-6	CDN	1.70dB
		EM clamp test process	3.36dB
		On-ear acoustic & Acoustic measurements on loudspeakers	1.68dB
		For electrical measurements / For measuring the demodulation on analogue wired network lines	1.64dB
		Audio breakthrough measurement for RS 2G/3G	1.76dB
		Audio breakthrough measurement for RS 4G	1.92dB
SH-SR02	IEC 61000-4-11	DIP Amplitude	5.0%
		DIP Time Event	4.0%

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

**1.3 TEST ENVIRONMENT CONDITIONS**

Test Item	Temperature	Humidity	Tested By
Continuous Disturbance voltage/current	17°C	49%	Calm Lan
Radiated disturbances	18°C	35%	Martin Yin
Harmonic current	22°C	51%	Sam Cheng
Voltage fluctuations (Flicker)	22°C	51%	Sam Cheng

Test Item	Temperature	Humidity	Pressure	Tested By
ESD	19°C	53%	1008hPa	Chengkai Yin
RS	17°C	49%	/	Nick Liu
EFT	20°C	47%	/	Payton zhang
Surge	20°C	47%	/	Payton zhang
CS	22°C	51%	/	Sam Cheng
Dip	20°C	47%	/	Payton zhang

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Children ride on toys
Brand Name	N/A
Test Model	TR1905
Series Model	N/A
Model Difference(s)	N/A
Power Source	DC voltage supplied from AC/DC adapter. Battery supply(only for the remote control)
Power Rating	I/P: 100-240V ~ 50/60Hz O/P: 12V --- 1000mA
Connecting I/O Port(s)	1* DC port 1* USB port 1* Audio port 1* SD card slot
Category of EUT	Category II Category III

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	FULL SYSTEM(Charging)
Mode 2	FULL SYSTEM(Forward)
Mode 3	FULL SYSTEM(Reverses)

Continuous Disturbance voltage/current test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(Charging)

Radiated disturbances test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(Charging)
Mode 2	FULL SYSTEM(Forward)
Mode 3	FULL SYSTEM(Reverses)

Harmonics / Flicker test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(Charging)

ESD test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(Charging)
Mode 2	FULL SYSTEM(Forward)
Mode 3	FULL SYSTEM(Reverses)

RS test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(Charging)
Mode 2	FULL SYSTEM(Forward)
Mode 3	FULL SYSTEM(Reverses)

EFT test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(Charging)

Surge test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(Charging)

CS test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(Charging)

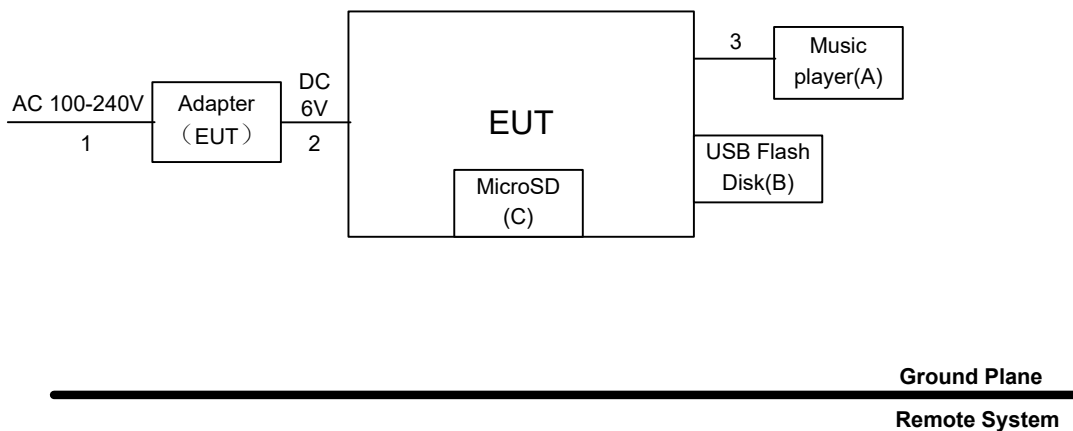
Dips test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(Charging)

### 2.3 EUT OPERATING CONDITIONS

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use. The standard test signals and output signal as following:

1. EUT connected to music player via audio cable.
2. Micro SD is plugged into the EUT.
3. USB ~ input from a USB storage device.

### 2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



## 2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
A	Music player	Apple	A1446	DCYTMOVTGK64
B	USB Flash Disk	Kingston	DTSE9G2	WXX1E7405LYS
C	Micro SD	Kingston	N/A	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	AC Cable	NO	NO	1.8m
2	DC Cable	NO	NO	1.5m
3	Audio Cable	YES	NO	1.5m

### 3. EMC EMISSION TEST

#### 3.1 TERMINAL DISTURBANCE VOLTAGES TEST

##### 3.1.1 LIMITS

###### General limits

Frequency range	Mains ports		Associated ports			
	Disturbance voltage		Disturbance voltage		Disturbance current	
1	2	3	4	5	6	7
MHz	Quasi-peak dB $\mu$ V	Average dB $\mu$ V	Quasi-peak dB $\mu$ V	Average dB $\mu$ V	Quasi-peak dB $\mu$ A	Average dB $\mu$ A
0,15 to 0,50	Decreasing linearly with the logarithm of the frequency from: 66 to 56		80	70	Decreasing linearly with the logarithm of the frequency from: 40 to 30	
0,50 to 5	56	46	74	64	30	20
5 to 30	60	50	74	64		
The lower limit applies at the transition frequencies.						
The test report shall state which test method was used and which limits were applied.						

###### Limits for mains port of tools

Frequency range	$P \leq 700 \text{ W}$		$700 \text{ W} < P \leq 1\,000 \text{ W}$		$P > 1\,000 \text{ W}$	
	2	3	4	5	6	7
MHz	Quasi-peak dB $\mu$ V	Average dB $\mu$ V	Quasi-peak dB $\mu$ V	Average dB $\mu$ V	Quasi-peak dB $\mu$ V	Average dB $\mu$ V
0,15 to 0,35	Decreasing linearly with the logarithm of the frequency from:					
	66 to 59	59 to 49	70 to 63	63 to 53	76 to 69	69 to 59
0,35 to 5	59	49	63	53	69	59
5 to 30	64	54	68	58	74	64
The lower limit applies at the transition frequencies.						
<b>Key</b>						
$P$ = rated power of the motor only.						

### 3.1.2 TEST PROCEDURE

#### 3.1.2.1 CONTINUOUS DISTURBANCE VOLTAGE/CURRENT FOR MAINS PORT

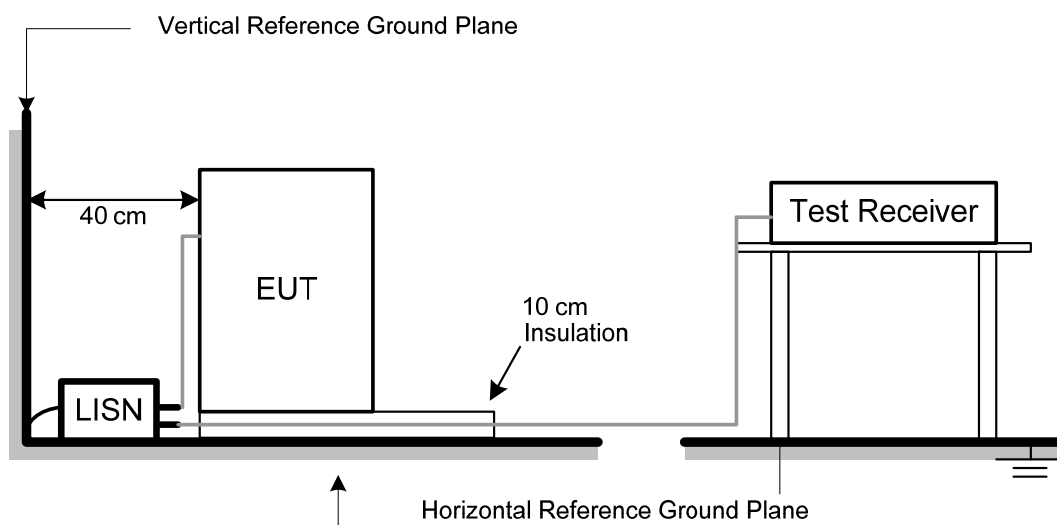
- a. The EUT was placed 0.1 meter thickness from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.  
If the equipment requires a dedicated ground connection, this shall be provided and bonded to the RGP. Mains cabling shall drape vertically to (but be insulated from) the horizontal RGP.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

#### 3.1.4 TEST SETUP

##### CONTINUOUS DISTURBANCE VOLTAGE/CURRENT FOR MAINS PORT



#### 3.1.5 TEST RESULTS

Please refer to the Appendix A.



## 3.2 RADIATED DISTURBANCES TEST

### 3.2.1 LIMITS

Testing method	Basic standard	Frequency range MHz	Limit <sup>a</sup> Quasi-peak dB $\mu$ V/m	Remarks
OATS or SAC <sup>b</sup>	CISPR 16-2-3	30 to 230	30	Measurement distance 10 m
		230 to 1 000	37	
FAR <sup>c</sup>	CISPR 16-2-3	30 to 230	42 to 35 <sup>d</sup>	Measurement distance 3 m
		230 to 1 000	42	
FAR <sup>c</sup>	IEC 61000-4-22	30 to 230	42 to 35 <sup>d</sup>	Measurement distance 3 m
		230 to 1 000	42	
TEM- Waveguide <sup>e</sup>	IEC 61000-4-20	30 – 230	30	-
		230 – 1 000	37	

<sup>a</sup> The lower limit is applies at the transition frequency.

<sup>b</sup> Measurements may be made at closer distance, down to 3 m. An inverse proportionality factor of 20 dB per decade shall be used to normalize the measured data to the specified distance for determining the limit. in this case the recommendations of the CISPR basic standards shall be considered when testing large EUT at frequency approaching 30 MHz, due to near field effects.

<sup>c</sup> All equipment shall be measured within the test volume as described in 5.3.4.3 and shown in Figures 12 to 19.

<sup>d</sup> Decreasing linearly with the logarithm of the frequency.

<sup>e</sup> The TEM waveguide method shall be limited to battery operated EUT without cables attached and with a maximum size according to 6.2 of IEC 61000-4-20:2010 (the largest dimension of the enclosure is equal to the wavelength at the maximum measurement frequency, 300 mm at 1 GHz).

The test report shall state which test method was used and which limits were applied.

**Table 3**

Notes:

- (1) The test result calculated as following:  
 Measurement Value = Reading Level + Correct Factor  
 Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain(if use)  
 Margin Level = Measurement Value – Limit Value

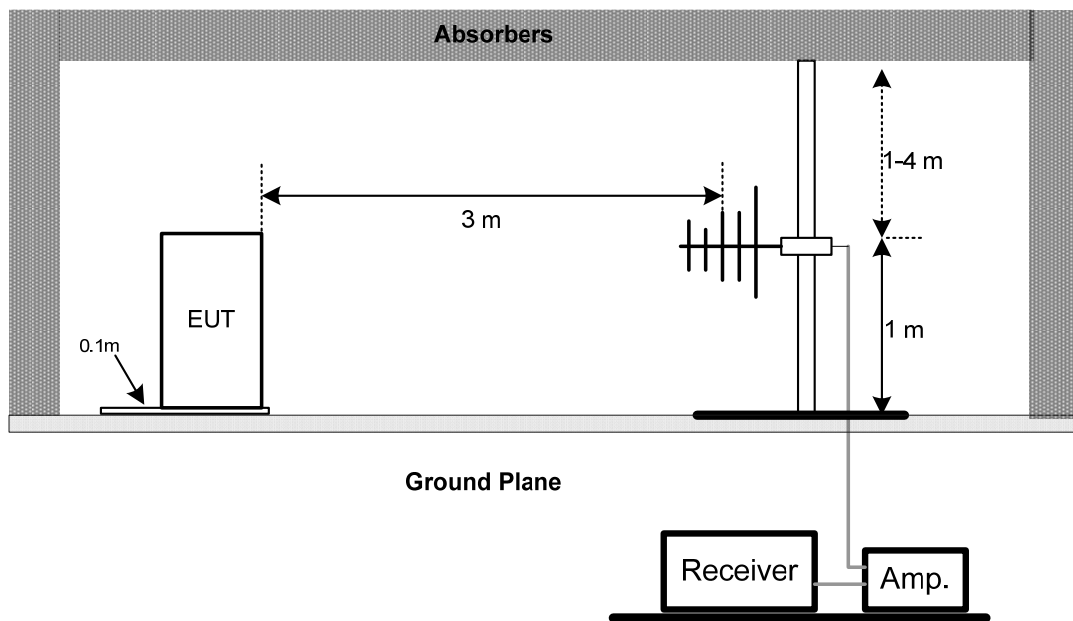
### 3.2.2 TEST PROCEDURE

- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a thickness 0.1 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

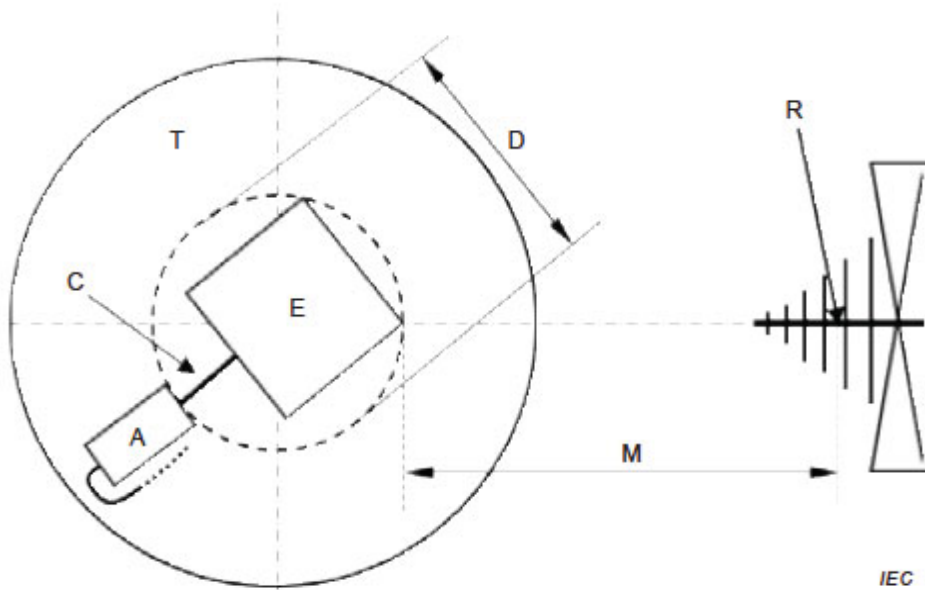
### 3.2.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.2.4 TEST SETUP



**3.2.5 MEASUREMENT DISTANCE**



**Mode Absorption Device**

Figure 1 – Radiated emission – Location of the EUT on the turntable and measuring distance

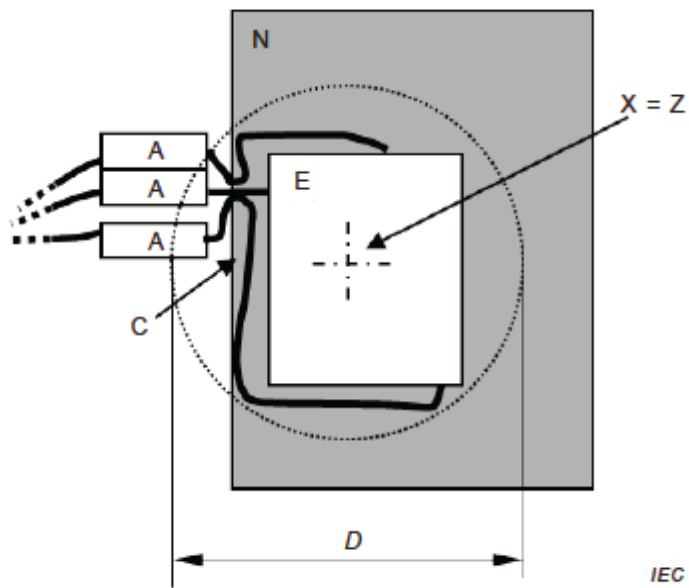


Figure 2 – Radiated emission – Example of test set-up for table-top EUT (top view)

**3.2.6 TEST RESULTS**

Please refer to the Appendix B.

### 3.3 HARMONIC CURRENT EMISSIONS TEST

#### 3.3.1 LIMITS

EN 61000-3-2		
Equipment Category	Harmonic Order	Max. Permissible Harmonic Current
	n	A
Class A	Odd Harmonics	
	3	2.30
	5	1.14
	7	0.77
	9	0.40
	11	0.33
	13	0.21
	$15 \leq n \leq 39$	$0.15 \times 15/n$
	Even Harmonics	
	2	1.08
	4	0.43
	6	0.30
	$8 \leq n \leq 40$	$0.23 \times 8/n$

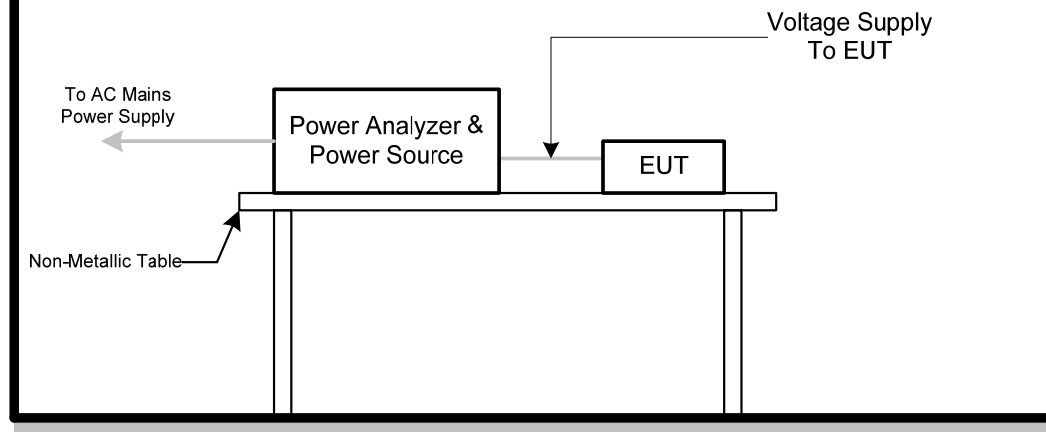
#### 3.3.2 TEST PROCEDURE

- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
- The classification of EUT is according to of EN 61000-3-2. The EUT is classified as Class A.
- The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

#### 3.3.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.3.4 TEST SETUP



### 3.3.5 TEST RESULTS

Please refer to the Appendix C.

### 3.4 VOLTAGE CHANGES, VOLTAGE FLUCTUATIONS AND FLICKER TEST

#### 3.4.1 LIMITS

Tests	Limits	Descriptions
	EN 61000-3-3	
Pst	$\leq 1.0$ , $T_p= 10$ min.	Short Term Flicker Indicator
Plt	$\leq 0.65$ , $T_p=2$ hr.	Long Term Flicker Indicator
dc	$\leq 3.3\%$	Relative Steady-State V-Chang
dmax	$\leq 4\%$	Maximum Relative V-change
d (t)	$\leq 500$ ms	Relative V-change characteristic

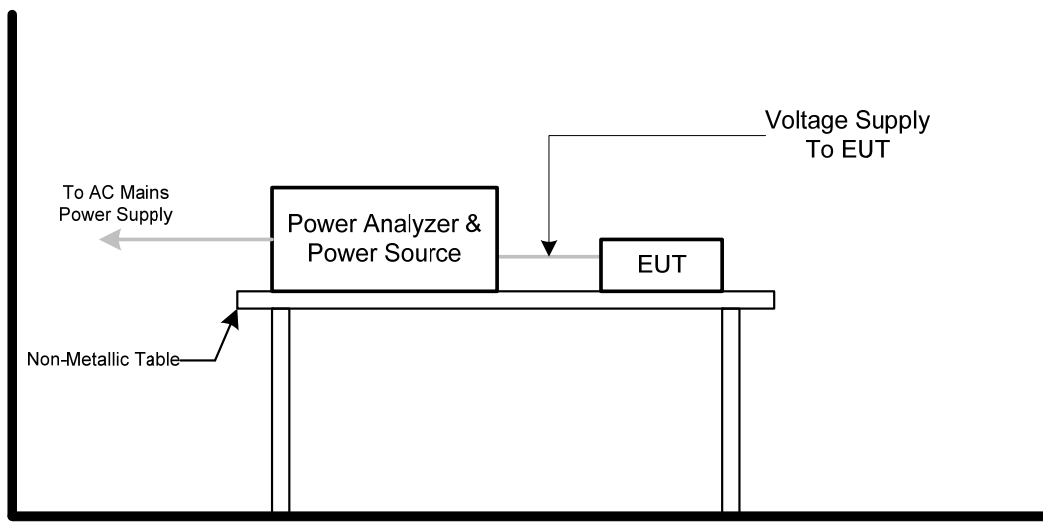
#### 3.4.2 TEST PROCEDURE

- Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in EN 61000-3-3 depend on which standard adopted for compliance measurement.
- All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

#### 3.4.3 DEVIATION FROM TEST STANDARD

No deviation

#### 3.4.4 TESTSETUP



#### 3.4.5 TEST RESULTS

Please refer to the Appendix D.

## 4. EMC IMMUNITY TEST

### 4.1 APPLICABILITY OF TEST ITEMS

According to EN 55014-2 standard, the general performance criteria as following:

Classification of apparatus				Basic Standard
Category I	Category II	Category III	Category IV	
( )	(√)	(√)	( )	
N/A	√	√	√	IEC 61000-4-2
N/A	N/A	√ Note(1)	√	IEC 61000-4-3: (RS)
N/A	√	N/A	√	IEC 61000-4-4
N/A	√	N/A	√	IEC 61000-4-5
N/A	√	N/A	N/A	IEC 61000-4-6:(up to 230 MHz)
N/A	N/A	N/A	√	IEC 61000-4-6:(up to 80 MHz)
N/A	√	N/A	√	IEC 61000-4-11:

Remark: "N/A" denotes test is not applicable in this Test Report  
 Note(1): This test is only applicable to the ride on toys operating with electronic devices.

**Category I:** apparatus containing no electronic control circuitry.

**Category II:** transformer toys, dual supply toys, mains powered motor operated appliances, tools, heating appliances and similar electric apparatus (for example – UV radiators, IR radiators and microwave ovens) containing electronic control circuitry with no clock frequency higher than 15 MHz.

**Category III:** equipment which in normal use, is not connected to a power network and has no cables attached. However, this apparatus shall also be tested as an apparatus in category II while it is connected to the mains network.

**Category IV:** all other apparatus covered by the scope of this standard.

<b>Criterion A</b>	The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
<b>Criterion B</b>	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
<b>Criterion C</b>	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

**4.2 STANDARD COMPLIANCE/SERVITY LEVEL/CRITERIA**

Tests Standard No.	Test Specification Level	Test Mode Test Ports	Performance Criterion
Electrostatic discharge immunity IEC 61000-4-2	±8 kV air discharge ±4 kV contact discharge	Direct Mode	B
	±4 kV HCP discharge ±4 kV VCP discharge	Indirect Mode	B
Radiated, radio-frequency, electromagnetic field immunity IEC 61000-4-3	80 MHz to 1000 MHz 3 V/m(rms), 1 kHz, 80%, AM modulated	Enclosure	A
Electrical fast transient/burst immunity IEC 61000-4-4	±1.0 kV(peak) 5/50ns Tr/Th 5 kHz Repetition Freq.	AC Power Port	B
	±0.5 kV(peak) 5/50ns Tr/Th 5 kHz Repetition Freq.	DC Power Port <b>(NOTE 1)</b>	B
	±0.5 kV(peak) 5/50ns Tr/Th 5 kHz Repetition Freq.	CTL/Signal Data Line Port	B
Surge immunity IEC 61000-4-5	±1 kV(5P/5N) 1.2/50(8/20) Tr/Th us	L-N	B
	±2 kV(5P/5N) 1.2/50(8/20) Tr/Th us	L-PE N-PE	B
Immunity to conducted disturbances, induced by radio-frequency fields IEC 61000-4-6 Category II	0.15 MHz to 230 MHz 1 V(rms), 1 kHz 80%, AM Modulated 150Ω source impedance	CTL/Signal Port	A
	0.15 MHz to 230 MHz 3 V(rms), 1 kHz 80%, AM Modulated 150Ω source impedance	AC Power Port	A
	0.15 MHz to 230 MHz 1 V(rms), 1 kHz 80%, AM Modulated 150Ω source impedance	DC Power Port <b>(NOTE 1)</b>	A
Voltage dips IEC 61000-4-11	Voltage Dips 30%	AC Power Port	C
	Voltage Dips 60%		C
	Voltage > 100%		C

**NOTE:**

(1) If the cables may be longer than 3 m.



### 4.3 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

#### 4.3.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	B
Discharge Voltage:	Air Discharge: $\pm 2$ kV, $\pm 4$ kV, $\pm 8$ kV (Direct) Contact Discharge: $\pm 2$ kV, $\pm 4$ kV (Indirect)
Polarity:	Positive & Negative
Number of Discharge	20 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second

#### 4.3.2 TEST PROCEDURE

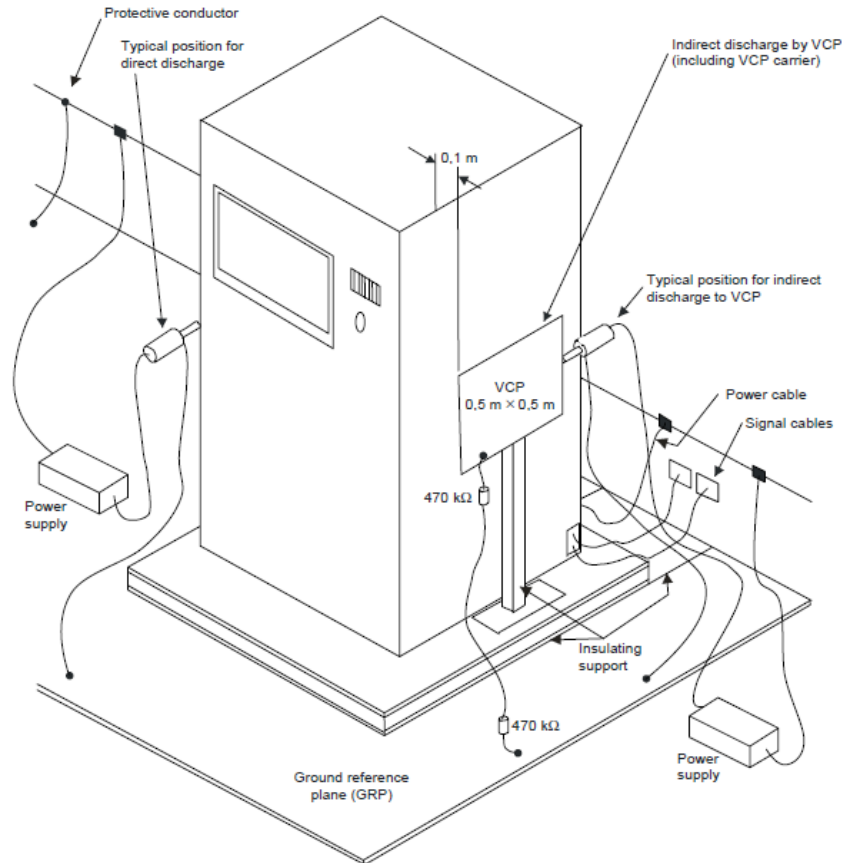
The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

- a. The test shall be performed with single discharges. On each pre-selected point at least 10 single discharges (in the most sensitive polarity) shall be applied.  
 NOTE 1 The minimum number of discharges applied is depending on the EUT; for products with synchronized circuits the number of discharges should be larger.  
 For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.  
 NOTE 2 The points to which the discharges should be applied may be selected by means of an exploration carried out at a repetition rate of 20 discharges per second, or more.  
 Vertical Coupling Plane (VCP):  
 The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.  
 The four faces of the EUT will be performed with electrostatic discharge.  
 Horizontal Coupling Plane (HCP):  
 The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.  
 The four faces of the EUT will be performed with electrostatic discharge.
- b. Air discharges at insulation surfaces of the EUT.  
 It was at least ten single discharges with positive and negative at the same selected point.
- c. For FLOOR-STANDING equipment:  
 The equipment under test was installed in a representative system as described in EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1 meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

### 4.3.3 DEVIATION FROM TEST STANDARD

No deviation / The requirement followed by the client's specification.

### 4.3.4 TEST SETUP



### 4.3.5 TEST RESULTS

Please refer to the Appendix E.

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

##### 4.4.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz
Field Strength:	3 V/m, (unmodulated, r.m.s.)
Modulation:	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1% of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	3 seconds

##### 4.4.2 TEST PROCEDURE

The EUT and support equipment are in a fully-anechoic chamber.

The testing distance from antenna to the EUT was 3 meters.

For FLOOR-STANDING equipment:

The EUT installed in a representative system as described in IEC 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

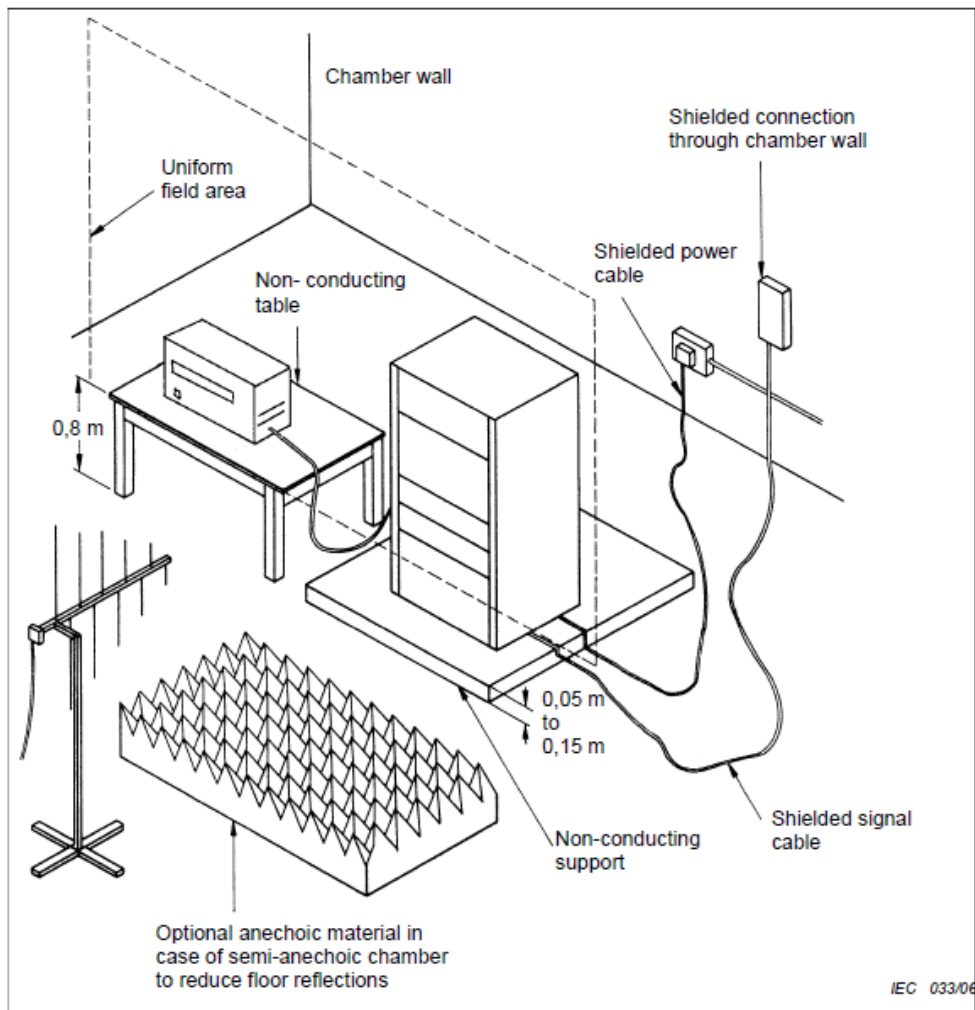
The other condition as following manner:

- a. The field strength level was 3 V/m(unmodulated, r.m.s).
- b. The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- d. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

##### 4.4.3 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.4.4 TEST SETUP



#### 4.4.5 TEST RESULTS

Please refer to the Appendix F.



## 4.6 SURGE IMMUNITY TEST

### 4.6.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-5
Required Performance	B
Wave-Shape:	1.2/50(8/20) Tr/Th $\mu$ s combination wave
Test Voltage :	AC Power Port: $\pm 1$ kV
Generator Source Impedance:	2 $\Omega$ of the low-voltage power supply network.
Phase Angle:	AC Port: 90°/270°
Pulse Repetition Rate:	1 time / min.
Number of Tests:	5 positive and 5 negative at selected points

### 4.6.2 TEST PROCEDURE

a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

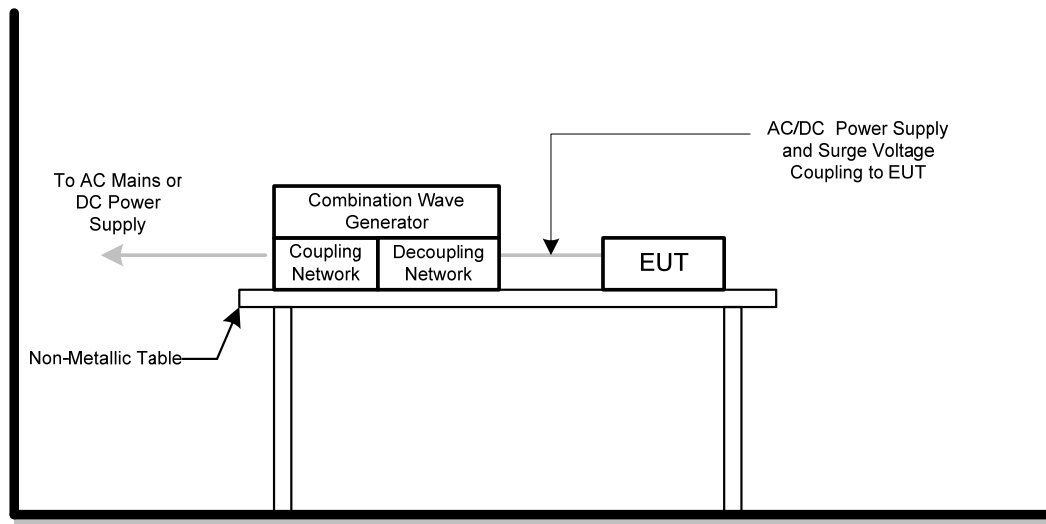
c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:

The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrester cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

#### 4.6.3 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.6.4 TEST SETUP



#### 4.6.5 TEST RESULTS

Please refer to the Appendix H.

## 4.7 IMMUNITY TO CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELDS TEST (CS)

### 4.7.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-6
Required Performance	A
Frequency Range:	0.15 MHz - 230 MHz
Field Strength:	AC power ports: 3 V, (unmodulated, r.m.s.) DC power ports: 1 V, (unmodulated, r.m.s.) CTL/Signal/Data Line Port: 1 V, (unmodulated, r.m.s.)
Modulation:	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1% of fundamental
Dwell Time:	3 seconds

### 4.7.2 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m\*1m min. and 0.65mm thick min.

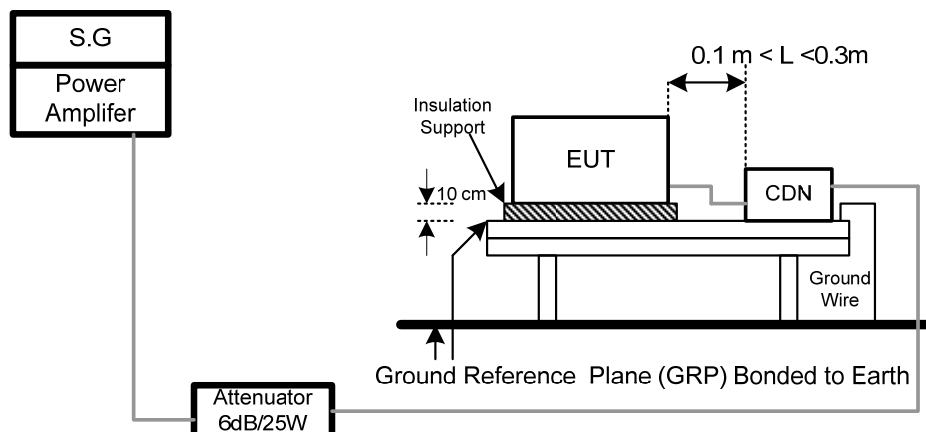
The other condition as following manner:

- The field strength level was 3 V, (unmodulated, r.m.s.).
- The frequency range is swept from 150 kHz to 80 MHz, with the signal 80%amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

### 4.7.3 DEVIATION FROM TEST STANDARD

No deviation.

### 4.7.4 TEST SETUP



### 4.7.5 TEST RESULTS

Please refer to the Appendix I.



## 4.8 VOLTAGE DIPS IMMUNITY TEST

### 4.8.1 TEST SPECIFICATION

Basic Standard:	IEC 61000-4-11
Required Performance	C (For 30% Voltage Dips) C (For 60% Voltage Dips) C (For 100% Voltage Dips)
Interval between Event:	Ten seconds
Phase Angle:	0°/180°
Test Cycle:	3 times

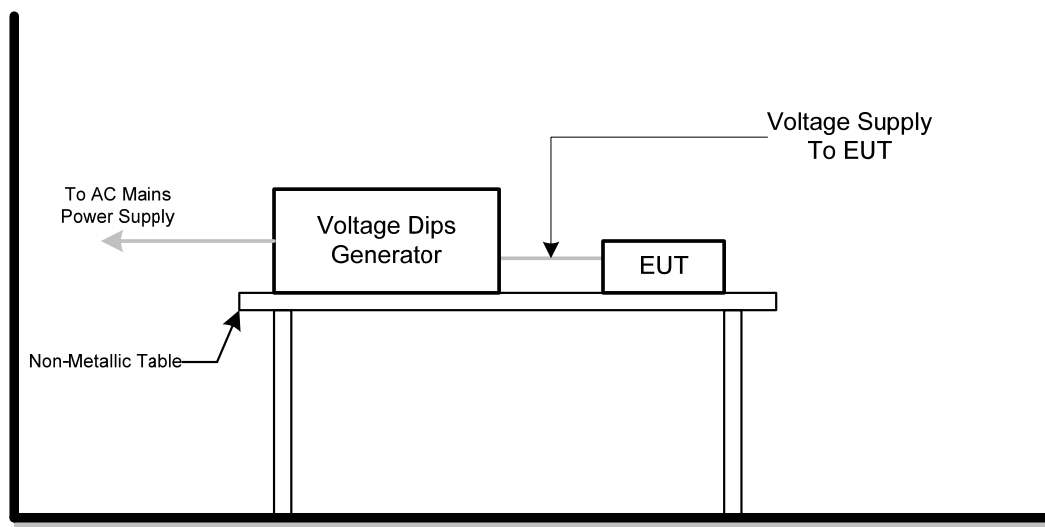
### 4.8.2 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

### 4.8.3 DEVIATION FROM TEST STANDARD

No deviation.

### 4.8.4 TEST SETUP



### 4.8.5 TEST RESULTS

Please refer to the Appendix J.

## 5. MEASUREMENT INSTRUMENTS LIST

Continuous Disturbance voltage/current					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Line Impedance Stabilisation Network	Schwarzbeck	NNLK 8121	8121-822	Mar. 29, 2020
2	TWO-LINE V-NETWORK	R&S	ENV216	101340	Sep. 01, 2020
3	Test Cable	emci	EMCRG400-BM-N M-10000	170628	Jul. 15, 2020
4	EMI Test Receiver	R&S	ESCI	100082	Mar. 29, 2020
5	50Ω Terminator	SHX	TF2-1G-A	17051602	Mar. 29, 2020
6	50Ω coaxial switch	Anritsu	MP59B	6201750902	Mar. 29, 2020
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Radiated disturbances					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 29, 2020
2	Pre-Amplifier	emci	EMC9135	980400	Mar. 29, 2020
3	MXE EMI Receiver	Keysight	N9038A	MY56400088	Mar. 29, 2020
4	Test Cable	emci	EMC104-SM-SM-7000	170330	Apr. 16, 2020
5	Test Cable	emci	EMC104-SM-SM-1000	170331	Apr. 16, 2020
6	Test Cable	emci	EMC104-SM-NM-3500	170621	Apr. 16, 2020
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Harmonics & Flickers					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	3 kVA single Phase Harmonics & Flicker Measuring System	Teseq	ProfLine 2103	1705A04171	Sep. 01, 2020
2	Measurement Software	California	CTS4 Version 4.23.0	N/A	N/A

ESD					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	ESD Simulator	Teseq	NSG 437	1133	Mar. 21, 2020

RS					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Microwave Log.-Per. Antenna	Schwarzbeck	STLP 9129	9129 027	Mar. 21, 2020
2	Radiated Immunity test system	Teseq	ITS 6006	37668	Sep. 07, 2020
3	RF Switch network	Teseq	RFB 2000	45816	N/A
4	Power meter	Teseq	PM 6006	75508	Sep. 07, 2020
5	Power meter	Teseq	PM 6006	75509	Sep. 07, 2020
6	40dB Dual Directional Coupler	Werlatone	C5982-10	112687	N/A
7	40dB Dual directional coupler	Werlatone	C10117-10	112805	N/A
8	Power Amplifier	MILMEGA	80RF1000-300	1078551	Sep. 07, 2020
9	Power Amplifier	MILMEGA	AS0860-50/50	1078552	Sep. 07, 2020
10	Test Cable	emci	S10172B	N/A	N/A
11	Test Cable	emci	S10172B	N/A	N/A
12	Test Cable	emci	RG214/U	N/A	N/A
13	Test Cable	emci	S10172B	N/A	N/A
14	Measurement Software	AUDIX	i2 20170414a Ver5	N/A	N/A

EFT					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	THE MODULAR SOLUTION FOR 6 KV APPLICATIONS	Teseq	NSG 3060	4055	Oct. 11, 2020
2	Measurement Software	Teseq	Win 3000 Version 1.3.2	N/A	N/A

Surge					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	THE MODULAR SOLUTION FOR 6 KV APPLICATIONS	Teseq	NSG 3060	4055	Oct. 11, 2020
2	Measurement Software	Teseq	Win 3000 Version 1.3.2	N/A	N/A

CS					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Compact immunity test system	Teseq	NSG 4070B-35	45751	Sep. 01, 2020
2	Attenuator	Teseq	ATN 6050	16121502	Sep. 07, 2020
3	50Ω Terminator	SHX	TF2-1G-A	17051603	Mar. 29, 2020
4	Measurement Software	Teseq	NSG 4070 Version 1.3.0.1	N/A	N/A
5	CDN	Teseq	CDN M016S	45669	Sep. 01, 2020

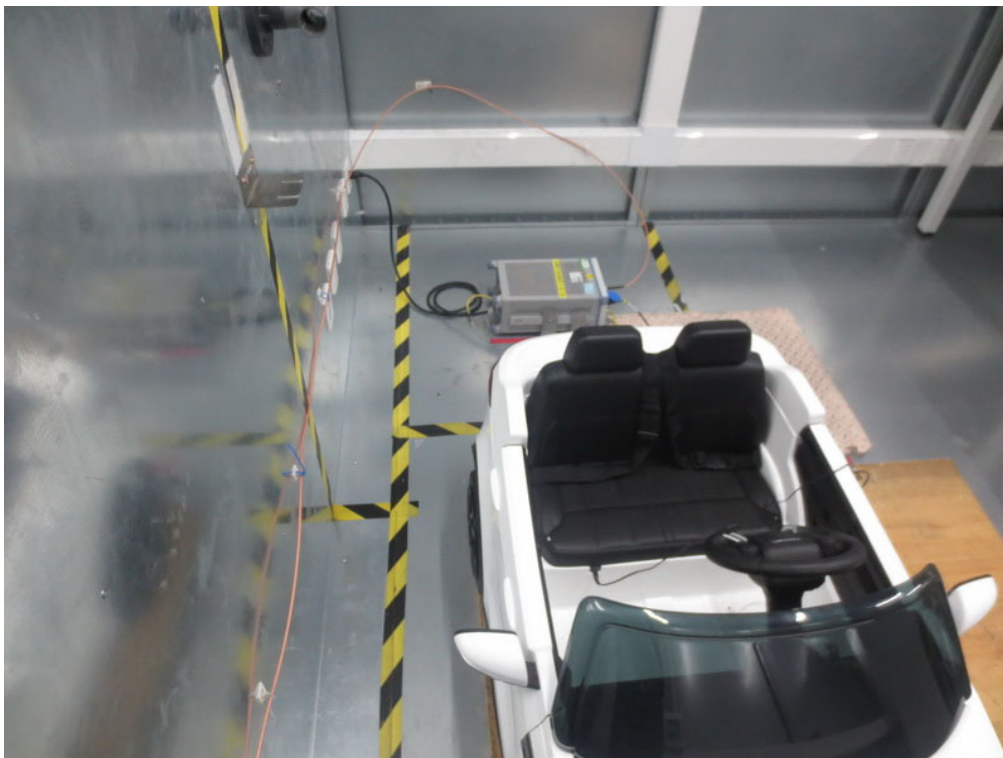
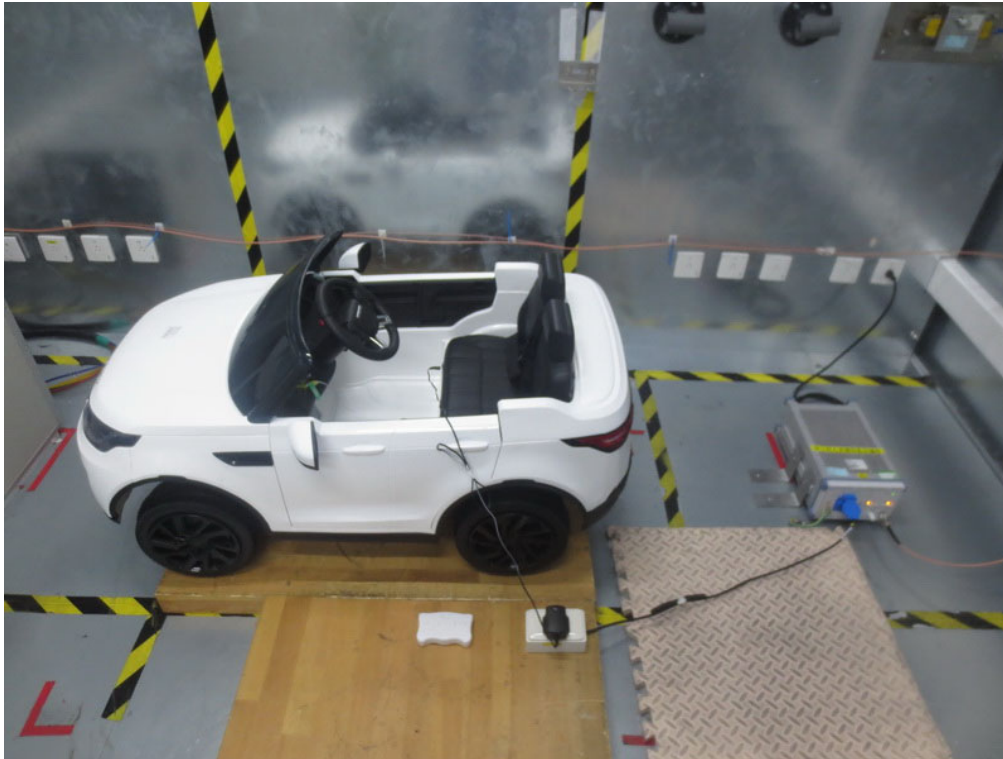
DIPS					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	THE MODULAR SOLUTION FOR 6 KV APPLICATIONS	Teseq	NSG 3060	4055	Oct. 11, 2020
2	Measurement Software	Teseq	Win 3000 Version 1.3.2	N/A	N/A

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

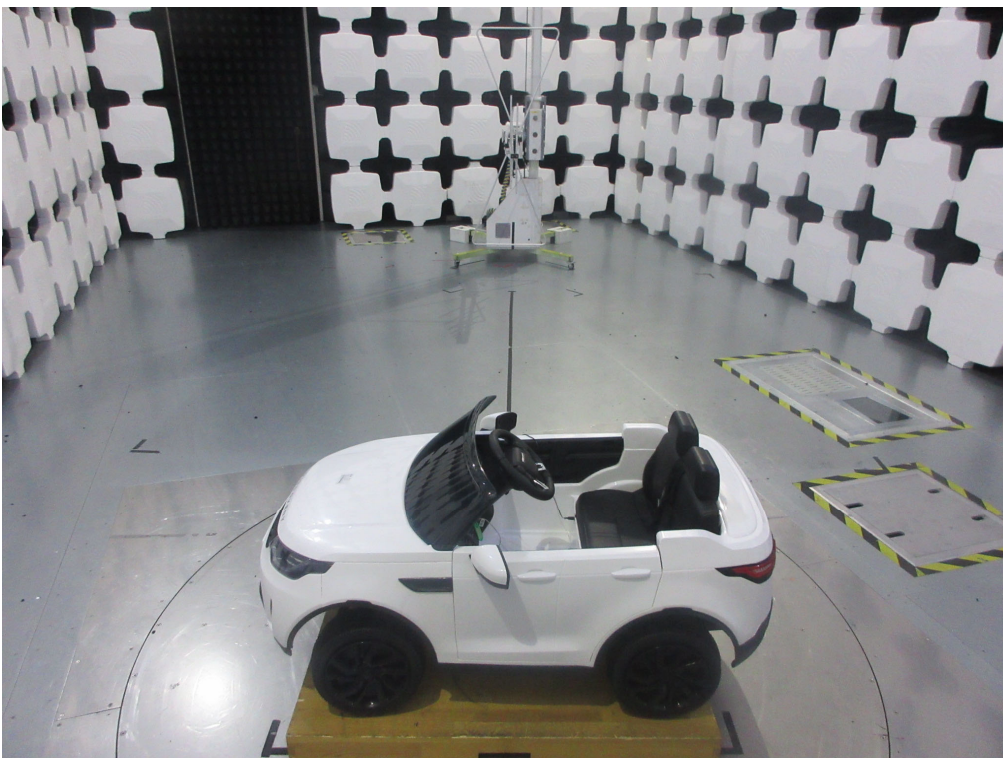
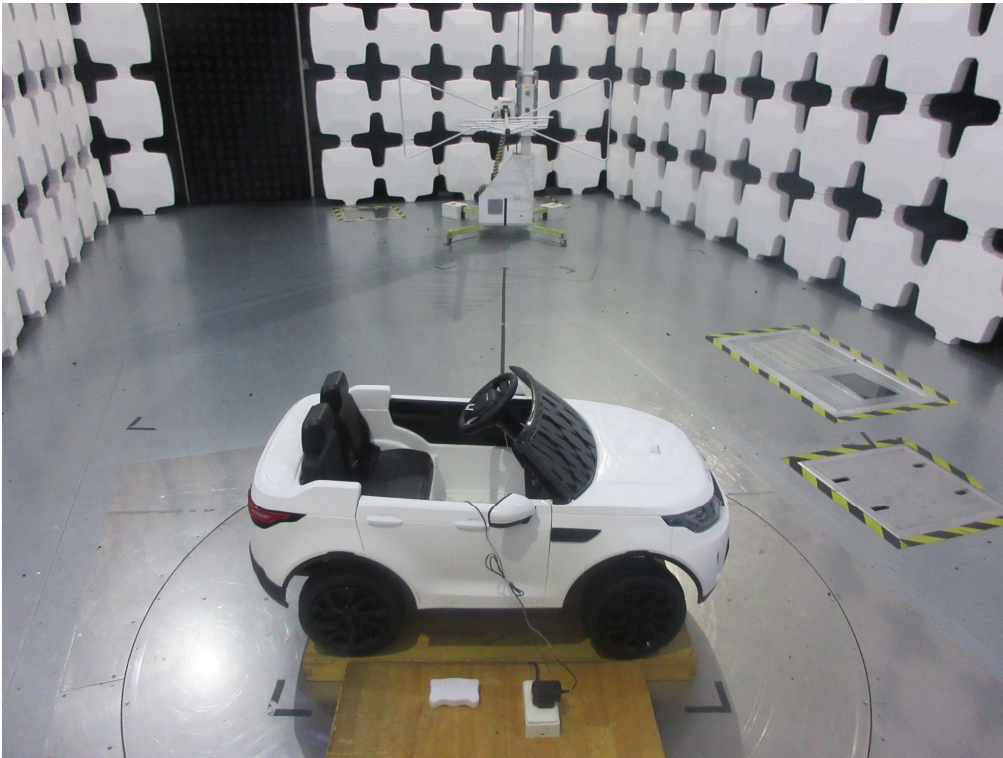
**6. EUT TEST PHOTO**

Terminal Disturbance Voltages





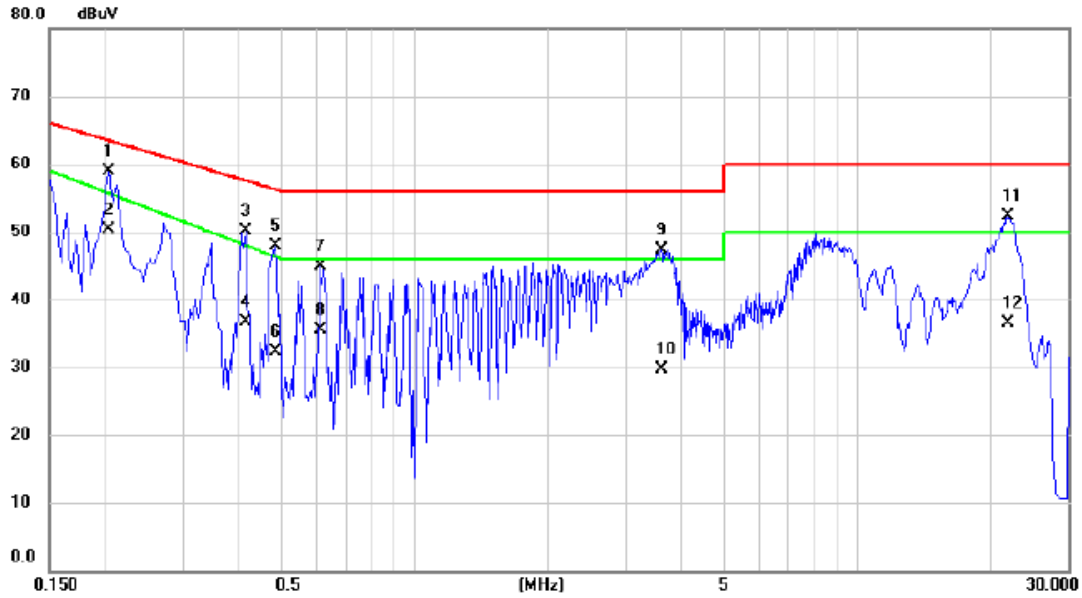
## Radiated Disturbances



**APPENDIX A - CONTINUOUS DISTURBANCE  
VOLTAGE/CURRENT**

Test Voltage :	AC 230V/50Hz
Test Mode	Mode 1

**Phase: Line**

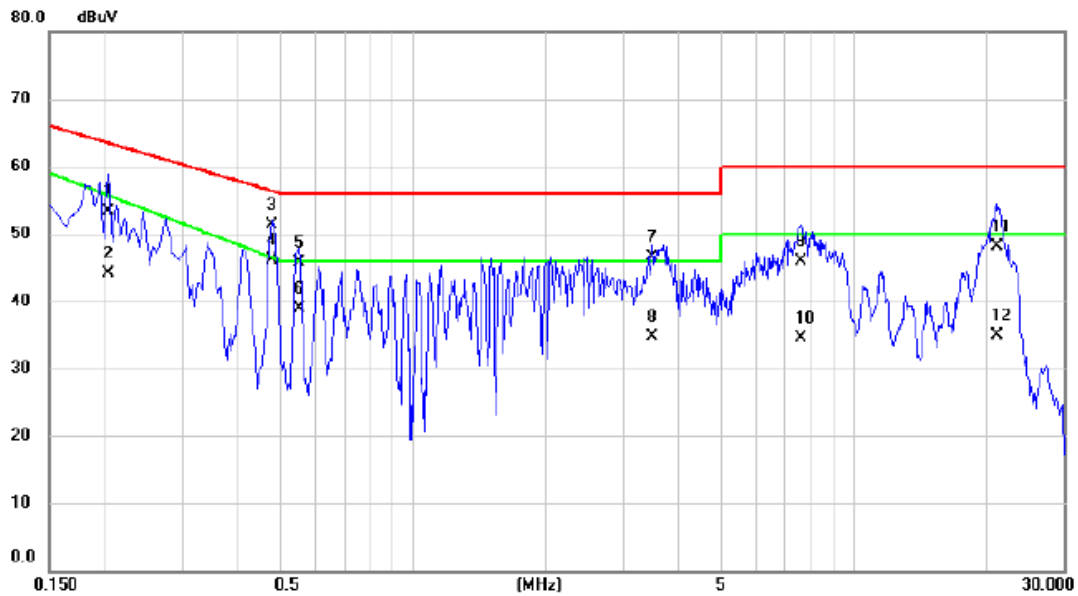


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.2040	49.18	9.82	59.00	63.45	-4.45	QP	
2		0.2040	40.50	9.82	50.32	55.68	-5.36	AVG	
3		0.4155	40.26	9.90	50.16	57.54	-7.38	QP	
4		0.4155	26.80	9.90	36.70	48.00	-11.30	AVG	
5		0.4875	37.90	9.99	47.89	56.21	-8.32	QP	
6		0.4875	22.30	9.99	32.29	46.27	-13.98	AVG	
7		0.6134	34.95	10.00	44.95	56.00	-11.05	QP	
8		0.6134	25.50	10.00	35.50	46.00	-10.50	AVG	
9		3.6060	37.27	10.03	47.30	56.00	-8.70	QP	
10		3.6060	19.60	10.03	29.63	46.00	-16.37	AVG	
11		21.9074	41.91	10.38	52.29	60.00	-7.71	QP	
12		21.9074	26.10	10.38	36.48	50.00	-13.52	AVG	



Test Voltage :	AC 230V/50Hz
Test Mode	Mode 1

**Phase: Neutral**

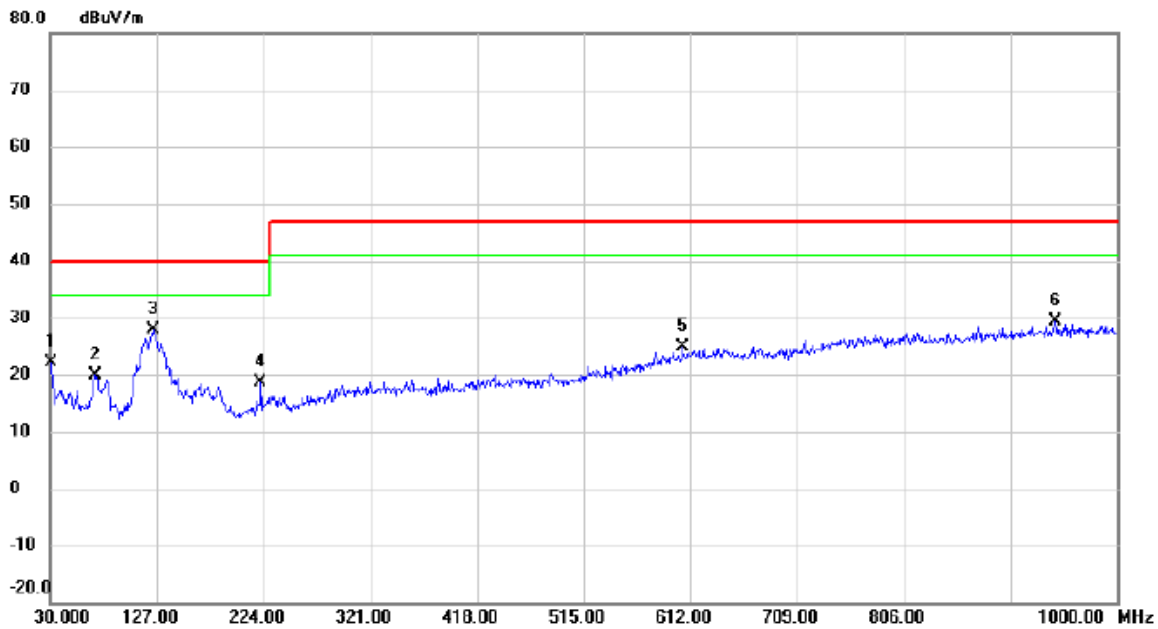


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.2040	43.70	9.66	53.36	63.45	-10.09	QP	
2		0.2040	34.40	9.66	44.06	55.68	-11.62	AVG	
3		0.4785	41.40	9.81	51.21	56.37	-5.16	QP	
4	*	0.4785	36.30	9.81	46.11	46.47	-0.36	AVG	
5		0.5505	35.90	9.85	45.75	56.00	-10.25	QP	
6		0.5505	29.10	9.85	38.95	46.00	-7.05	AVG	
7		3.4935	36.40	10.03	46.43	56.00	-9.57	QP	
8		3.4935	24.70	10.03	34.73	46.00	-11.27	AVG	
9		7.5705	35.80	10.14	45.94	60.00	-14.06	QP	
10		7.5705	24.40	10.14	34.54	50.00	-15.46	AVG	
11		21.1875	37.90	10.12	48.02	60.00	-11.98	QP	
12		21.1875	24.70	10.12	34.82	50.00	-15.18	AVG	

## **APPENDIX B - RADIATED DISTURBANCES**

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

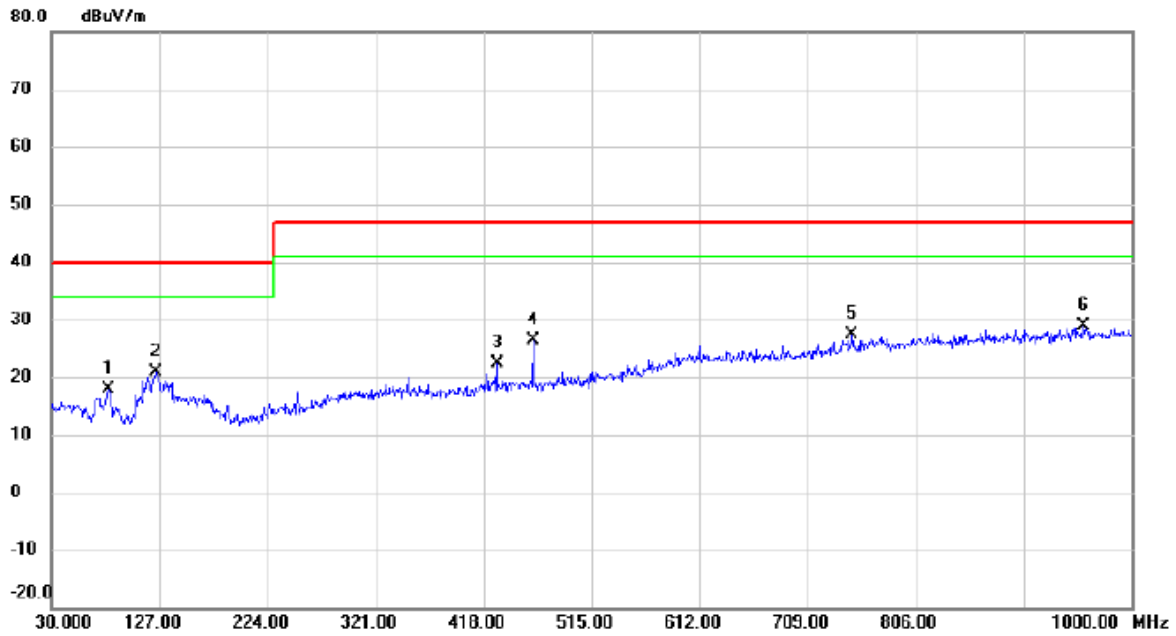
**Polarization: Vertical**



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		30.0000	39.49	-17.34	22.15	40.00	-17.85	QP	
2		70.7400	39.19	-19.41	19.78	40.00	-20.22	QP	
3	*	123.1200	44.97	-17.02	27.95	40.00	-12.05	QP	
4		221.0900	36.41	-17.90	18.51	40.00	-21.49	QP	
5		604.2400	33.58	-8.64	24.94	47.00	-22.06	QP	
6		943.7400	34.54	-5.18	29.36	47.00	-17.64	QP	

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

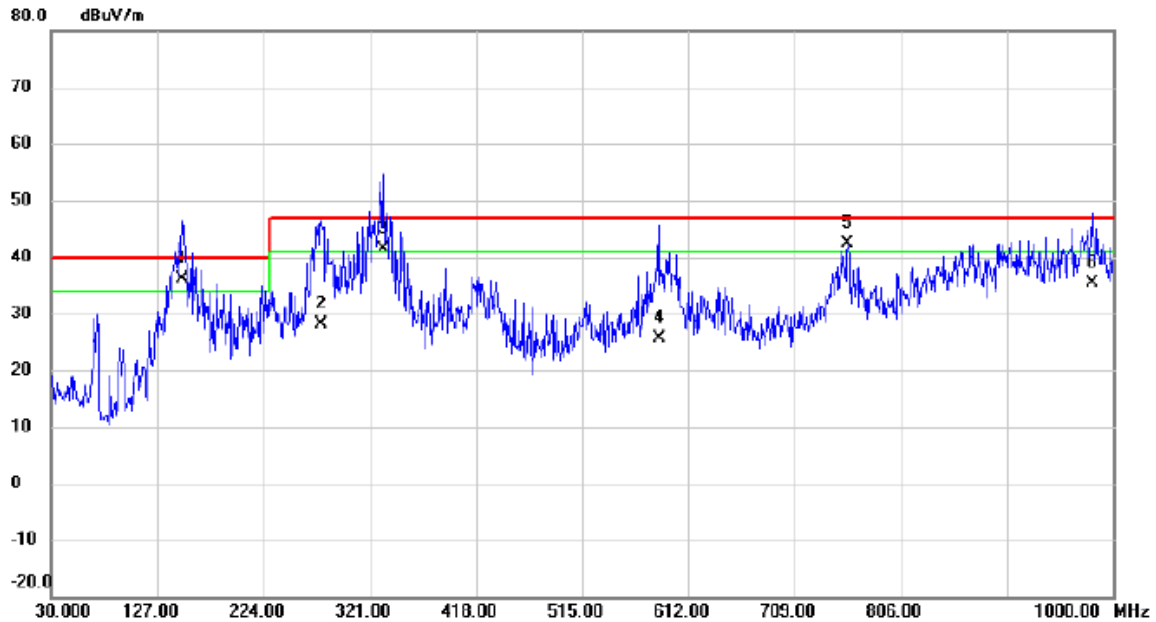
**Polarization: Horizontal**



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		81.4100	38.23	-20.32	17.91	40.00	-22.09	QP	
2		124.0900	37.83	-17.00	20.83	40.00	-19.17	QP	
3		429.6400	35.26	-12.97	22.29	47.00	-24.71	QP	
4		462.6200	39.38	-12.91	26.47	47.00	-20.53	QP	
5		748.7700	34.02	-6.71	27.31	47.00	-19.69	QP	
6	*	956.3500	33.98	-5.11	28.87	47.00	-18.13	QP	

Test Voltage	DC 15V
Test Mode	Mode 2

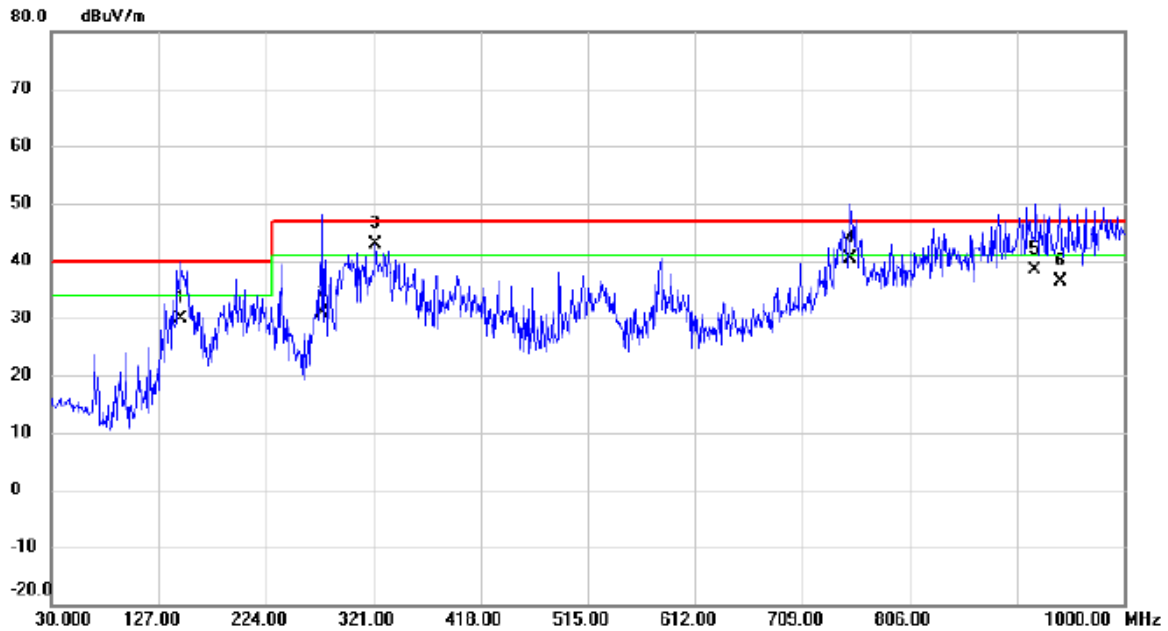
**Polarization: Vertical**



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	149.3100	51.07	-14.87	36.20	40.00	-3.80	QP	
2		276.3800	43.55	-15.34	28.21	47.00	-18.79	QP	
3	!	332.6400	55.13	-13.85	41.28	47.00	-5.72	QP	
4		584.8400	35.16	-9.43	25.73	47.00	-21.27	QP	
5	!	757.5000	48.93	-6.63	42.30	47.00	-4.70	QP	
6		980.6000	40.35	-4.98	35.37	47.00	-11.63	QP	

Test Voltage	DC 15V
Test Mode	Mode 2

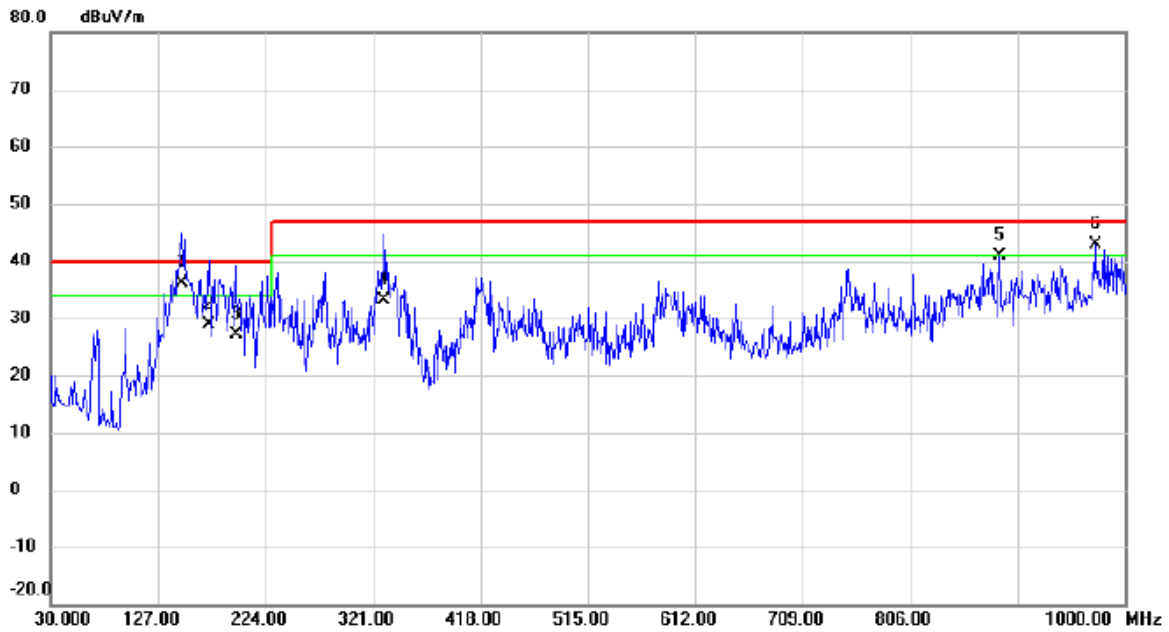
**Polarization: Horizontal**



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		147.3700	44.82	-15.04	29.78	40.00	-10.22	QP	
2		275.4100	46.35	-15.42	30.93	47.00	-16.07	QP	
3	*	322.9400	56.89	-13.97	42.92	47.00	-4.08	QP	
4		752.6500	47.08	-6.65	40.43	47.00	-6.57	QP	
5		919.4900	43.68	-5.31	38.37	47.00	-8.63	QP	
6		941.8000	41.56	-5.19	36.37	47.00	-10.63	QP	

Test Voltage	DC 15V
Test Mode	Mode 3

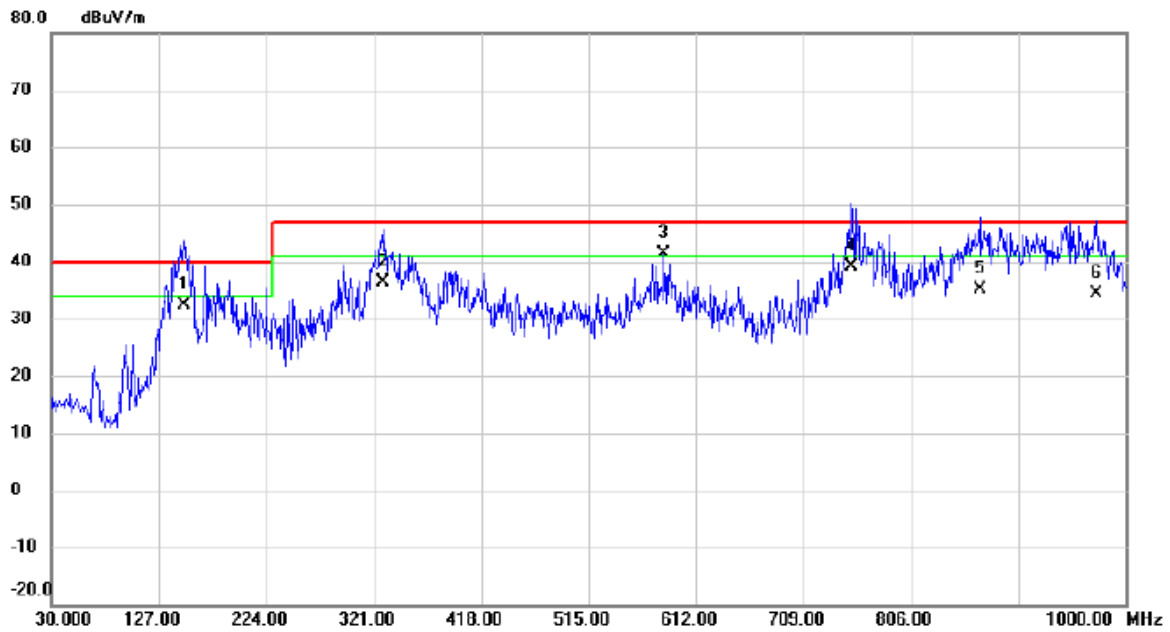
**Polarization: Vertical**



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	148.3400	51.06	-14.94	36.12	40.00	-3.88	QP	
2		172.5900	44.96	-16.09	28.87	40.00	-11.13	QP	
3		196.8400	45.73	-18.72	27.01	40.00	-12.99	QP	
4		330.7000	47.00	-13.88	33.12	47.00	-13.88	QP	
5		886.5100	46.49	-5.58	40.91	47.00	-6.09	QP	
6	!	972.8400	47.80	-5.02	42.78	47.00	-4.22	QP	

Test Voltage	DC 15V
Test Mode	Mode 3

**Polarization: Horizontal**



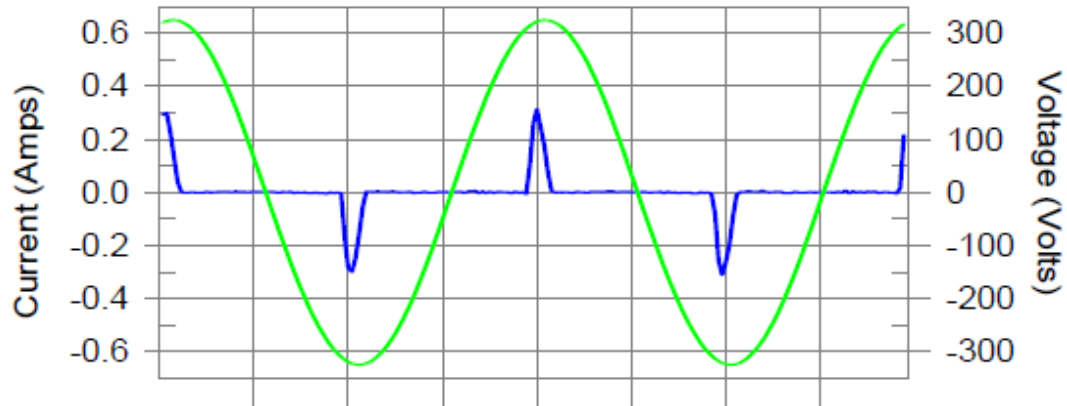
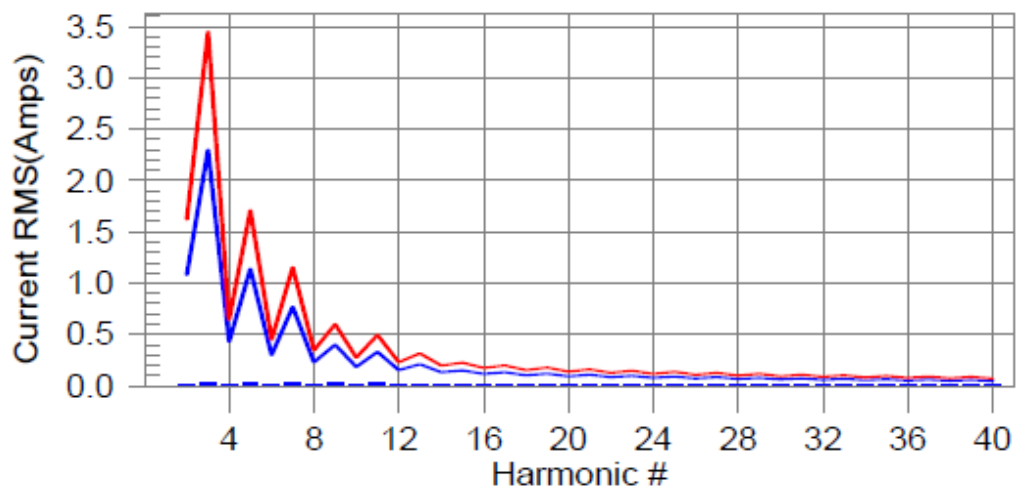
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		149.3100	47.29	-14.87	32.42	40.00	-7.58	QP	
2		329.7300	50.34	-13.89	36.45	47.00	-10.55	QP	
3	*	582.9000	50.87	-9.53	41.34	47.00	-5.66	QP	
4		751.6800	45.74	-6.66	39.08	47.00	-7.92	QP	
5		868.0800	41.04	-5.81	35.23	47.00	-11.77	QP	
6		973.8100	39.40	-5.02	34.38	47.00	-12.62	QP	



## **APPENDIX C - HARMONICS CURRENT**

**Harmonics – Class A**

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

Current & voltage waveforms

Harmonics and Class A limit line      European Limits


Test result: Pass      Worst harmonics H15-6.0% of 150% limit, H15-8.9% of 100% limit

**Current Test Result Summary (Run time)**

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

**Highest parameter values during test:**

V RMS (Volts):	229.69	Frequency(Hz):	50.00
I Peak (Amps):	0.328	I RMS (Amps):	0.076
I Fund (Amps):	0.034	Crest Factor:	4.394
Power (Watts):	7.7	Power Factor:	0.447

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.001	1.620	N/A	Pass
3	0.032	2.300	1.4	0.033	3.450	1.0	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.031	1.140	2.7	0.031	1.710	1.8	Pass
6	0.000	0.300	N/A	0.001	0.450	N/A	Pass
7	0.028	0.770	3.6	0.028	1.155	2.5	Pass
8	0.000	0.230	N/A	0.000	0.345	N/A	Pass
9	0.025	0.400	6.2	0.025	0.600	4.2	Pass
10	0.000	0.184	N/A	0.000	0.276	N/A	Pass
11	0.021	0.330	6.4	0.021	0.495	4.3	Pass
12	0.000	0.153	N/A	0.000	0.230	N/A	Pass
13	0.017	0.210	8.2	0.017	0.315	5.5	Pass
14	0.000	0.131	N/A	0.000	0.197	N/A	Pass
15	0.013	0.150	8.9	0.013	0.225	6.0	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.010	0.132	7.5	0.010	0.198	5.0	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.007	0.118	5.8	0.007	0.178	3.9	Pass
20	0.000	0.092	N/A	0.002	0.138	N/A	Pass
21	0.005	0.107	N/A	0.005	0.161	N/A	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.003	0.098	N/A	0.003	0.147	N/A	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.003	0.090	N/A	0.003	0.135	N/A	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.003	0.083	N/A	0.003	0.125	N/A	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.004	0.078	N/A	0.004	0.116	N/A	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.003	0.073	N/A	0.003	0.109	N/A	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.003	0.068	N/A	0.003	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.002	0.064	N/A	0.002	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.002	0.061	N/A	0.002	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.001	0.058	N/A	0.001	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

**Voltage Source Verification Data (Run time)**

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

**Highest parameter values during test:**

Voltage (Vrms):	229.69	Frequency(Hz):	50.00
I Peak (Amps):	0.328	I RMS (Amps):	0.076
I Fund (Amps):	0.034	Crest Factor:	4.394
Power (Watts):	7.7	Power Factor:	0.447

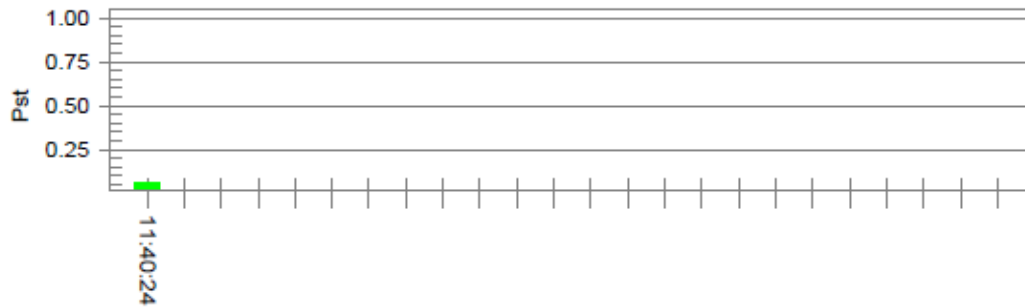
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.069	0.459	14.95	OK
3	0.428	2.067	20.70	OK
4	0.031	0.459	6.70	OK
5	0.023	0.919	2.47	OK
6	0.019	0.459	4.03	OK
7	0.031	0.689	4.53	OK
8	0.011	0.459	2.33	OK
9	0.018	0.459	3.92	OK
10	0.016	0.459	3.48	OK
11	0.018	0.230	7.98	OK
12	0.013	0.230	5.48	OK
13	0.014	0.230	6.12	OK
14	0.005	0.230	2.01	OK
15	0.010	0.230	4.48	OK
16	0.008	0.230	3.38	OK
17	0.011	0.230	4.85	OK
18	0.008	0.230	3.47	OK
19	0.013	0.230	5.49	OK
20	0.009	0.230	3.82	OK
21	0.007	0.230	3.27	OK
22	0.003	0.230	1.46	OK
23	0.006	0.230	2.81	OK
24	0.004	0.230	1.93	OK
25	0.006	0.230	2.80	OK
26	0.003	0.230	1.23	OK
27	0.010	0.230	4.28	OK
28	0.003	0.230	1.43	OK
29	0.006	0.230	2.53	OK
30	0.004	0.230	1.96	OK
31	0.007	0.230	2.83	OK
32	0.003	0.230	1.43	OK
33	0.006	0.230	2.62	OK
34	0.002	0.230	0.96	OK
35	0.005	0.230	2.38	OK
36	0.003	0.230	1.31	OK
37	0.006	0.230	2.46	OK
38	0.002	0.230	0.98	OK
39	0.006	0.230	2.49	OK
40	0.007	0.230	2.97	OK

## **APPENDIX D - VOLTAGE FLUCTUATION AND FLICKER**

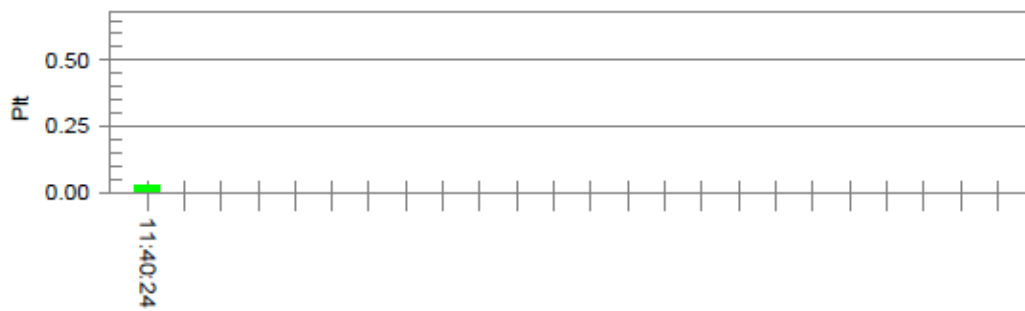
Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

Pst and limit line

European Limits



Plt and limit line



**Parameter values recorded during the test:**

Vrms at the end of test (Volt):	229.60		
T-max (mS):	0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.00	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650 Pass

## APPENDIX E - ESD

Test Voltage	AC 230V/50Hz	DC 15V
Test Mode	Mode 1	Mode 2/ Mode 3

Mode	Air Discharge								Contact Discharge					
	2kV		4kV		8kV		- kV		2kV		4kV		- kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	A	A	A	A	-	-	A	A	A	A	-	-
2	A	A	A	A	A	A	-	-	A	A	A	A	-	-
3	A	A	A	A	A	A	-	-	-	-	-	-	-	-
4	A	A	A	A	A	A	-	-	-	-	-	-	-	-
5	A	A	A	A	A	A	-	-	-	-	-	-	-	-
6	A	A	A	A	A	A	-	-	-	-	-	-	-	-
7	A	A	A	A	A	A	-	-	-	-	-	-	-	-
Criteria	B						-		B					
Result	A						-		A					

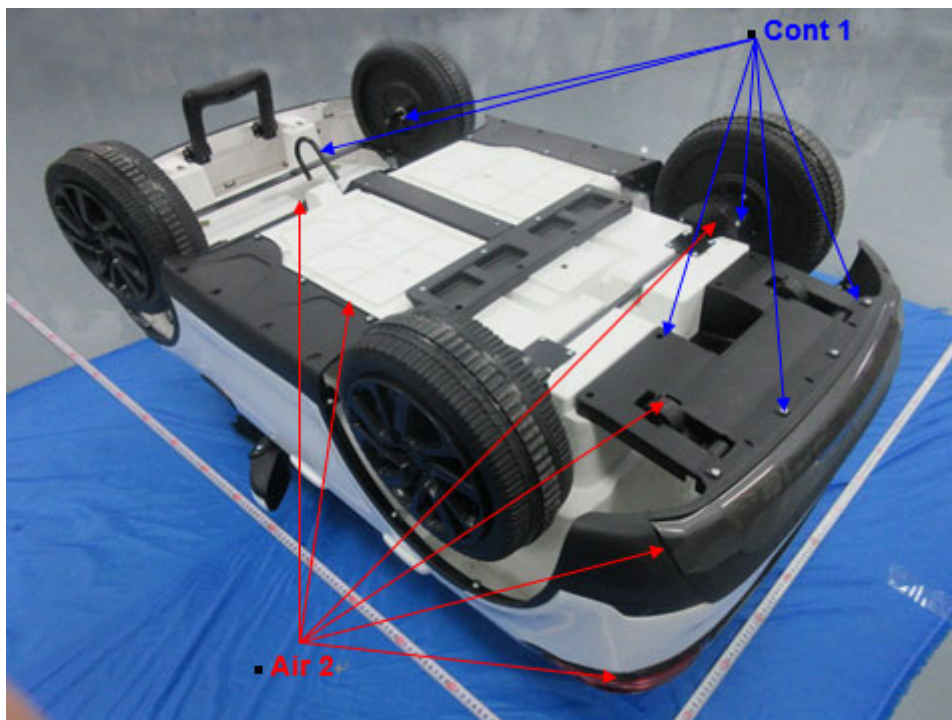
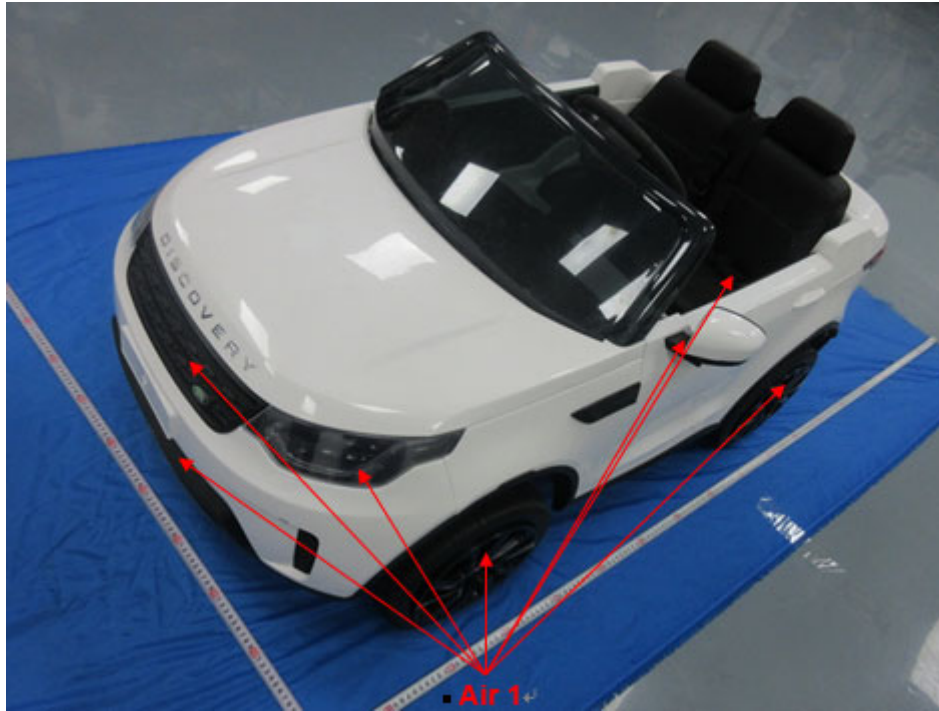
Mode	HCP Contact Discharge						VCP Contact Discharge							
	2kV		4kV		- kV		2kV		4kV		- kV			
Location	P	N	P	N	P	N	P	N	P	N	P	N		
Left side	A	A	A	A	-	-	A	A	A	A	-	-		
Right side	A	A	A	A	-	-	A	A	A	A	-	-		
Front side	A	A	A	A	-	-	A	A	A	A	-	-		
Rear side	A	A	A	A	-	-	A	A	A	A	-	-		
Criteria	B						-		B					
Result	A						-		A					

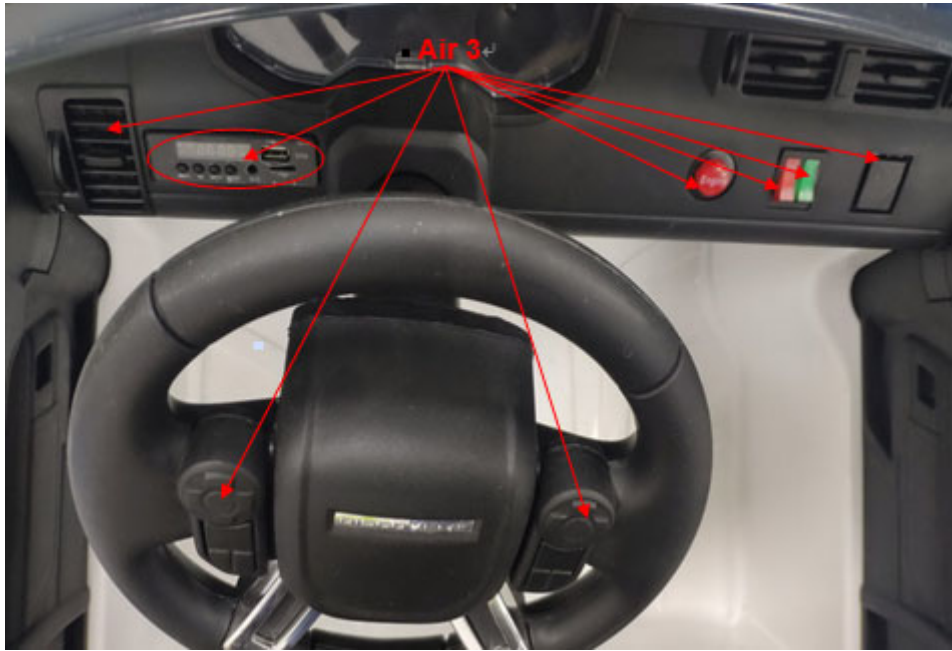
Note:

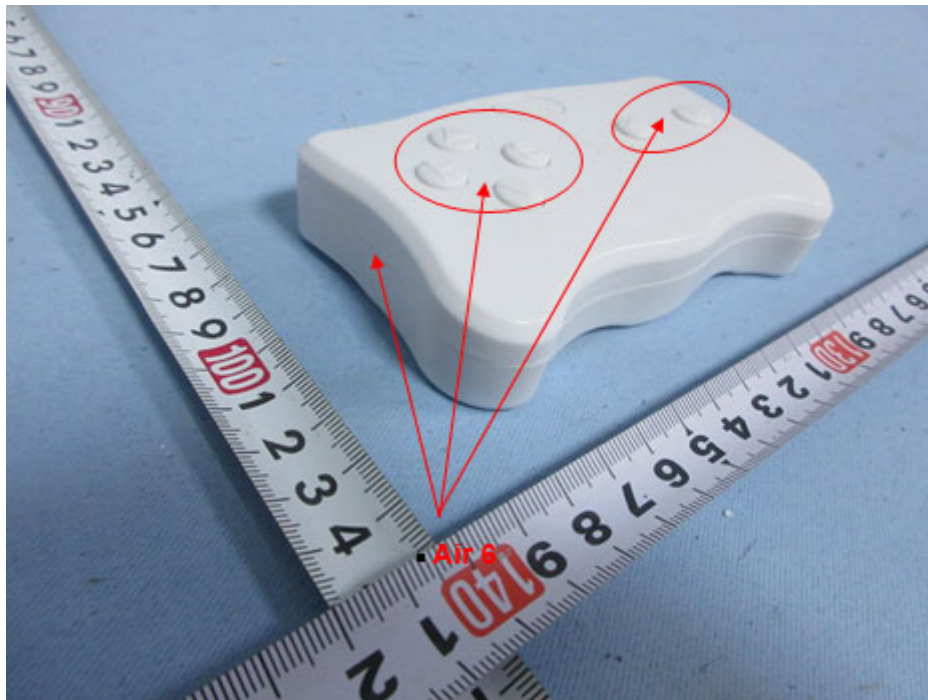
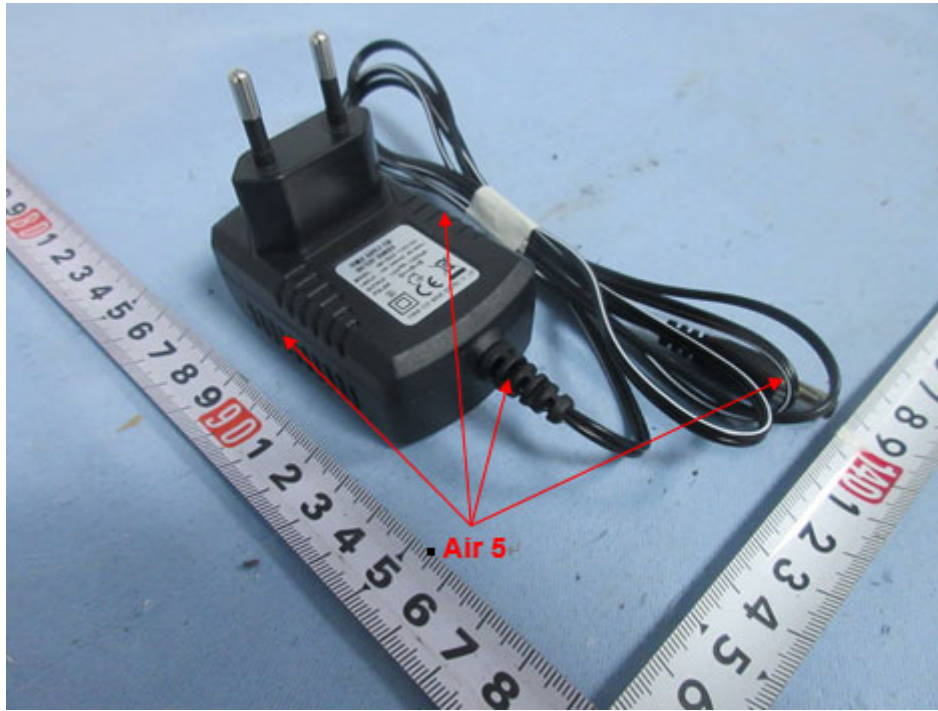
- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) N/A - denotes test is not applicable in this test report



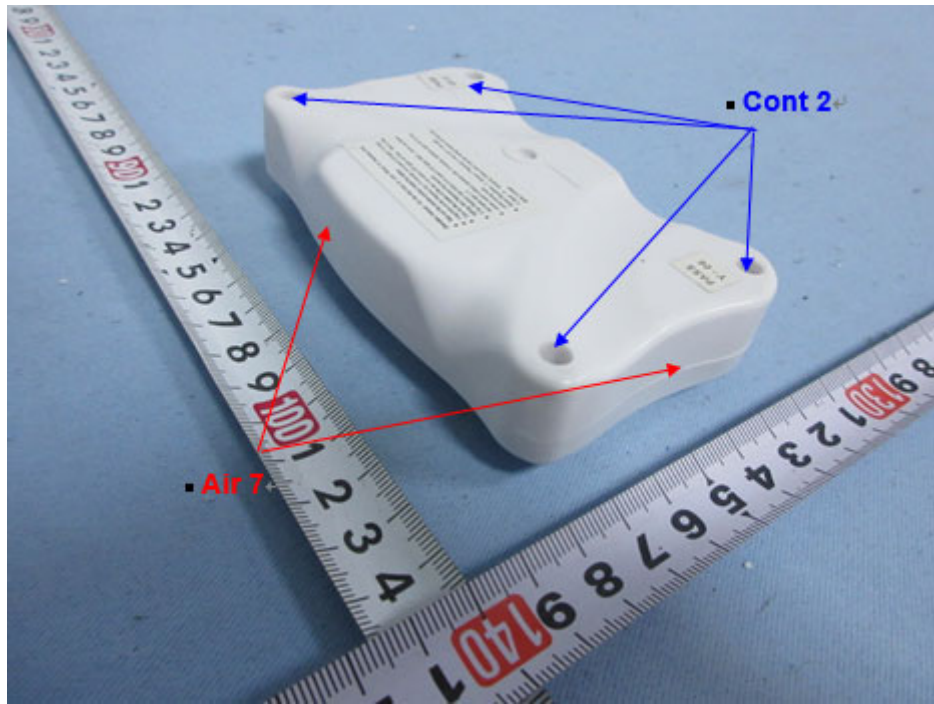
PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED











## APPENDIX F - RS

Test Voltage	AC 230V/50Hz	DC 15V
Test Mode	Mode 1	Mode 2/ Mode 3

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Modulation	Azimuth	Criterion	Result
80 - 1000	H / V	3V/m	AM Modulated 1000Hz, 80%	0	A	A
				90		
				180		
				270		

**APPENDIX G - EFT/BURST**

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

EUT Ports Tested		Polarity	Repetition Frequency	Test Level	Criterion	Result
				1kV		
AC Power Port	Line (L)	+	5 kHz	A	B	A
		-	5 kHz	A		
	Neutral (N)	+	5 kHz	A	B	A
		-	5 kHz	A		
	L+N	+	5 kHz	A	B	A
		-	5 kHz	A		



## APPENDIX H - SURGE

Test Voltage :	AC 230V/50Hz
Test Mode :	Mode 1

Wave Form EUT Ports Tested	1.2/50(8/20)Ti/Th us						Criteria	Results
	Polarity	Phase	Voltage					
			1kV	-kV	-kV	-kV		
L - N	+	90°	A	-	-	-	B	A
	-	270°	A	-	-	-		

## **APPENDIX I - INJECTION CURRENT**

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

Test Ports (Mode)	Freq. Range (MHz)	Field Strength	Modulation	Perform. Criterion	Result
Input/ Output AC. Power Port	0.15 - 230	3 V	AM Modulated 1000 Hz 80%	A	A
Input/ Output DC. Power Port		1 V		A	N/A
Signal Line		1 V		A	N/A

## **APPENDIX J - VOLTAGE INTERRUPTION/DIPS**

Test Voltage	AC 100V/50Hz, AC 230V/50Hz, AC 240V/50Hz
Test Mode	Mode 1

AC 100V/50Hz				
Item	Voltage Reduction	Duration (Periods)	Criterion	Result
Voltage Dips	30%	25	C	A
Voltage Dips	60%	10	C	A
Voltage	100%	0.5	C	C

AC 230V/50Hz				
Item	Voltage Reduction	Duration (Periods)	Criterion	Result
Voltage Dips	30%	25	C	A
Voltage Dips	60%	10	C	A
Voltage	100%	0.5	C	C

AC 240V/50Hz				
Item	Voltage Reduction	Duration (Periods)	Criterion	Result
Voltage Dips	30%	25	C	A
Voltage Dips	60%	10	C	A
Voltage	100%	0.5	C	C

**End of Test Report**