



Shenzhen CTL Testing Technology Co., Ltd.
Tel: +86-755-89486194 E-Mail: ctl@ctl-lab.com

Test Report

EN 55032 Electromagnetic compatibility of multimedia equipment - Emission Requirements

EN 55024 Information technology equipment – Immunity characteristics – Limits and methods of measurement

Report Reference No. : CTL1803266031-E

Compiled by

(position+printed name+signature) : File administrators Katherine Wu

Supervised by

(position+printed name+signature) : Technique principal Ivan Xie

Approved by

(position+printed name+signature) : Manager Jacky Chen

Date of issue : Apr. 03, 2018

Testing Laboratory Name : Shenzhen CTL Testing Technology Co., Ltd.

Address : Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

Testing location/ procedure : Full application of Harmonised standards ☒
Partial application of Harmonised standards ☐
Other standard testing methods ☐

Applicant's name : USU019

Address :

Test specification:

Standard : EN 55032: 2015 EN 55024: 2010+ A1: 2015

Non-standard test method : /

Test Report Form No. :

TRF Originator : Shenzhen CTL Testing Technology Co., Ltd

Master TRF : Dated 2011-01

Shenzhen CTL Testing Technology Co., Ltd.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen CTL Testing Technology Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen CTL Testing Technology Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test item description : CHARGING CABLE

Trade Mark : Spector&co

Test voltage : DC 5V

Result : Pass

EMC -- Test Report

Test Report No. : CTL1803266031-E	Apr. 03, 2018
	Date of issue

Equipment under Test : CHARGING CABLE

Type / Model : T986

Listed Models : /

Applicant : USU019

Address :

Manufacturer : Shenzhen universal through technology co.ltd

Address : 10th,Bldg,HuaFeng Science industrial park,Fengtang Street,Fuyong
Town,Bao'an district,shenzhen

Test Result	Pass
--------------------	-------------

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

History of this test report

Report No.	Version	Description	Issued Date
CTL1803266031-E	V1.0	Initial Issued Report	Apr. 03, 2018



Contents

1.	TEST STANDARDS	5
2.	SUMMARY	6
2.1.	General Remarks:	6
2.2.	Equipment Under Test	6
2.3.	Short description of the Equipment under Test (EUT)	6
2.4.	EUT operation mode:	6
2.5.	EUT configuration:	7
2.6.	Performance Criteria	7
3.	TEST ENVIRONMENT	8
3.1.	Address of the test laboratory	8
3.2.	Test Facility	8
3.3.	Environmental conditions	8
3.4.	Test Description	9
3.5.	Statement of the measurement uncertainty	9
3.6.	Equipments Used during the Test	10
4.	TEST CONDITIONS AND RESULTS	11
4.1.	Radiated Emission	11
4.2.	Electrostatic discharge	14
4.3.	Radiated, radio-frequency, electromagnetic field	16
4.4.	Magnetic Field Immunity	18
5.	Test Setup Photos	19
6.	Photos of the EUT	21

1. TEST STANDARDS

The tests were performed according to following standards:

[EN 55032:2015](#) Electromagnetic compatibility of multimedia equipment - Emission Requirements
[EN 55024: 2010+ A1: 2015](#) information technology equipment – Immunity characteristics – Limits



2. SUMMARY

2.1. General Remarks:

Date of receipt of test sample : Mar. 26, 2018

Testing commenced on : Mar. 27, 2018

Testing concluded on : Apr. 03, 2018

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage : ☐ 230V / 50 Hz ☐ 115V / 60Hz
☐ 12 V DC ☐ 24 V DC
☒ Other (specified in blank below)

DC 5V

2.3. Short description of the Equipment under Test (EUT)

The EUT is a CHARGING CABLE

2.4. EUT operation mode:

The equipment under test was operated during the measurement under the following conditions:

The tests are carried out with surge protective devices disconnected.

Test program (customer specific)

Emissions tests.....: According to EN55032, searching for the highest disturbance.

Immunity tests: According to EN55024, searching for the highest susceptibility.

2.5. EUT configuration:

(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurement:

■ - supplied by the manufacturer

o - supplied by the lab

2.6. Performance Criteria

Definition related to the performance level:

- ☒ based on the used product standard
☐ based on the declaration of the manufacturer, requestor or purchaser

Criterion A:

Definition: normal performance within limits specified by the manufacturer, requestor or purchaser:

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.

Criterion B:

Definition: temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention:

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.

Criterion C:

Definition: temporary loss of function or degradation of performance, the correction of which requires operator intervention:

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.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

FCC-Registration No.: 399832

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 399832, December 08, 2017.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	<u>22-25 ° C</u>
Humidity:	<u>40-54 %</u>
Atmospheric pressure:	<u>950-1050mbar</u>

3.4. Test Description

Emission Measurement		
Radiated Emission	EN 55032:2015	PASS
Immunity Measurement		
Electrostatic Discharge	EN 55024: 2010+ A1: 2015 IEC 61000-4-2: 2008	PASS
RF Field Strength Susceptibility	EN 55024: 2010+ A1: 2015 IEC 61000-4-3: 2010	PASS
Power Frequency Magnetic Field Susceptibility Test	EN 55024: 2010+ A1: 2015 IEC 61000-4-8: 2009	PASS

Remark:

1. The test result PASS and /or FAIL has no relationship with the measurement uncertainty.

3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission(chamber1)	30~1000MHz	$\pm 3.20\text{dB}$	(1)
Radiated Emission(chamber2)	30~1000MHz	$\pm 3.56\text{dB}$	(1)
Radiated Emission	1~12.75GHz	$\pm 4.32\text{dB}$	(1)
Conducted Emission	0.15~30MHz	$\pm 2.66\text{dB}$	(1)
Disturbance Power	30~300MHz	$\pm 2.32\text{dB}$	(1)

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

3.6. Equipments Used during the Test

Radiated Emission (Chamber 1)						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	ULTRA-BROADBAND ANTENNA	Sunol Sciences Corp.	JB1 Antenna	A061713	2017/10/26	2018/10/25
2	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2017/06/01	2018/05/31
3	Horn Antenna	Sunol Sciences Corp	DRH-118	A062013	2017/06/01	2018/05/31

Electrostatic Discharge						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	ESD Simulator	TESEQ AG	NSG 437	1058	2017/06/01	2018/05/31

RF Field Strength Susceptibility						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	SIGNAL GENERATOR	ROHDE & SCHWARZ	SMB100A	177746	2017/06/01	2018/05/31
2	Power Amplifier	Agilent	PA0810-150W	MY41497845	2017/06/01	2018/05/31
3	Power Meter	Agilent	E4419B	GB40201833	2017/06/01	2018/05/31
4	Directional Coupler	Werlantone	C5982-10	109275	N/A	N/A
5	Test Antenna-Bi-Log	SCHWARZBECK	VULB 9163	9163-624	2017/06/01	2018/05/31

Power Frequency Magnetic Field Susceptibility						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	MAGNETIC COIL	HTEC Instruments Ltd.	HPFMF	154402	2017/06/01	2018/05/31

4. TEST CONDITIONS AND RESULTS

4.1. Radiated Emission

For test instruments and accessories used see section 3.6.

4.1.1. Description of the test location

Test location: Radiation Lab

4.1.2. Limits of disturbance

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dB μ V/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

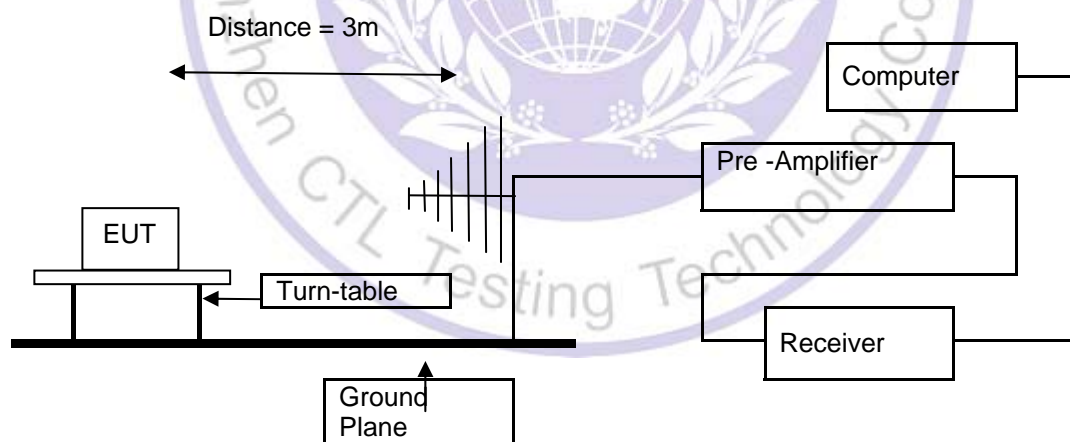
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

4.1.3. Description of the test set-up

4.1.3.1. Operating Condition

The EUT is set to work shall be carried out with full load mode during the test, and the maximum emanating results are recorded.

4.1.3.2. Configuration of test setup



4.1.4. Test result

The requirements are **Fulfilled**

Band Width: 120KHz

Frequency Range: 30MHz to 1000MHz

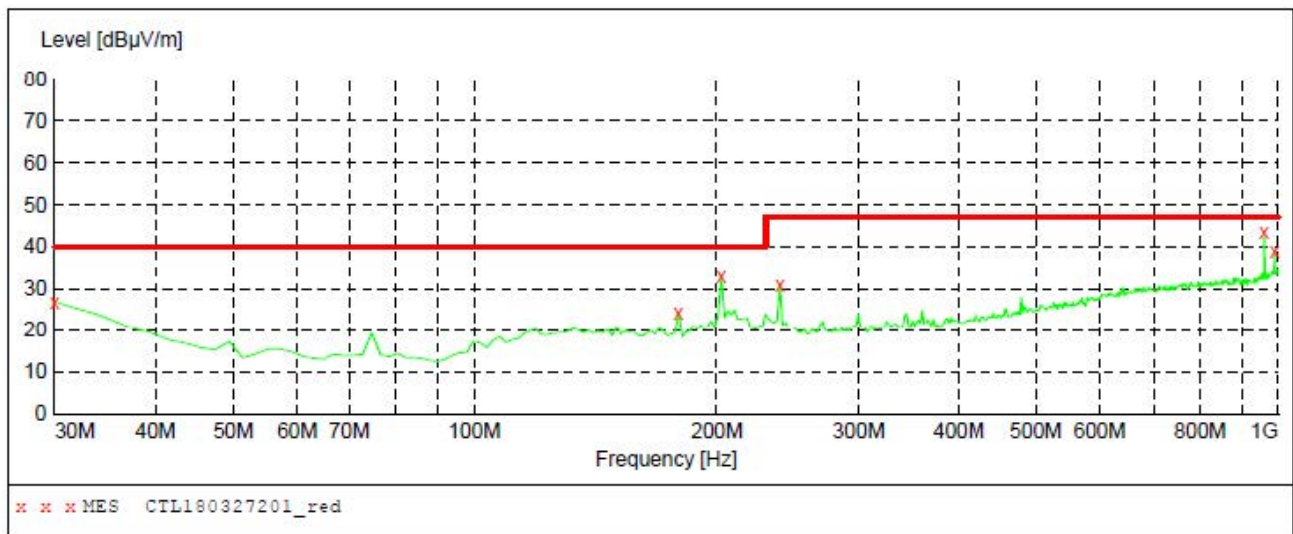
Remarks: The limits are kept. For detailed results, please see the following page(s).

Shenzhen CTL Testing Technology Co., Ltd**Radiation Emission Test EN 55032**

EUT: T986
 Manufacturer:
 Operating Condition: WORKING
 Test Site: Chamber1
 Operator: ZBS
 Test Specification: DC 5V
 Comment:
 Start of Test: 3/27/2018 / 12:31:06AM

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency				
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1

**MEASUREMENT RESULT: "CTL180327201_red"**

3/27/2018 12:34AM

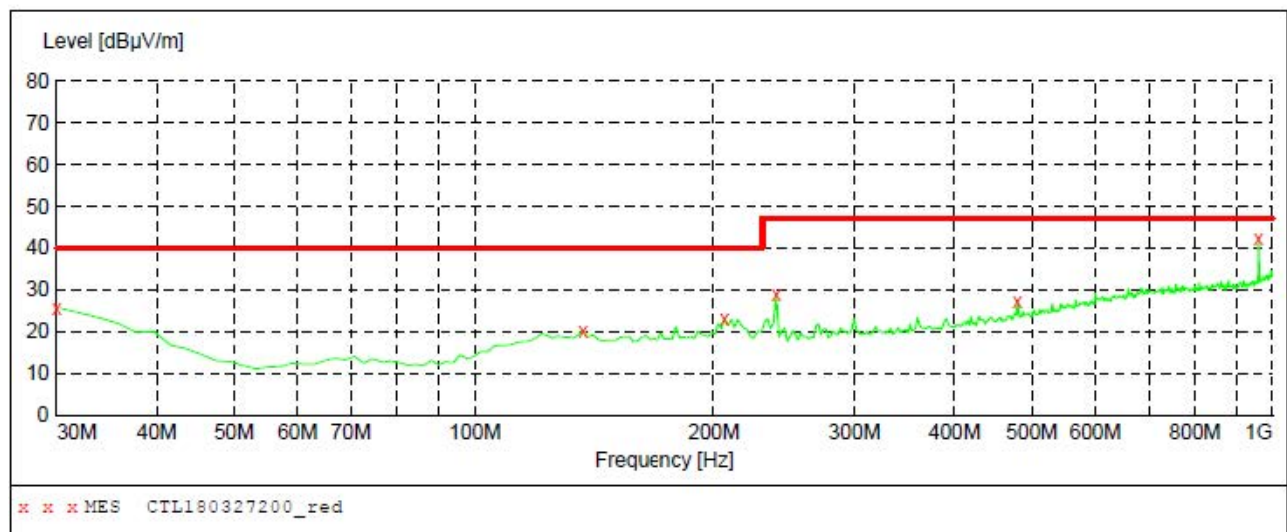
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	26.90	22.1	40.0	13.1	---	0.0	0.00	HORIZONTAL
179.380000	24.40	14.6	40.0	15.6	---	0.0	0.00	HORIZONTAL
202.660000	32.90	14.6	40.0	7.1	---	0.0	0.00	HORIZONTAL
239.520000	30.80	14.1	47.0	16.2	---	0.0	0.00	HORIZONTAL
961.200000	43.40	27.5	47.0	3.6	---	0.0	0.00	HORIZONTAL
990.300000	38.80	28.0	47.0	8.2	---	0.0	0.00	HORIZONTAL

Shenzhen CTL Testing Technology Co.,Ltd**Radiation Emission Test EN 55032**

EUT: T986
 Manufacturer:
 Operating Condition: WORKING
 Test Site: Chamber1
 Operator: ZBS
 Test Specification: DC 5V
 Comment:
 Start of Test: 3/27/2018 / 12:07:17AM

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency				
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1

**MEASUREMENT RESULT: "CTL180327200_red"**

3/27/2018 12:29AM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	25.70	22.1	40.0	14.3	---	0.0	0.00	VERTICAL
136.700000	20.20	15.0	40.0	19.8	---	0.0	0.00	VERTICAL
206.540000	23.00	14.6	40.0	17.0	---	0.0	0.00	VERTICAL
239.520000	28.80	14.1	47.0	18.2	---	0.0	0.00	VERTICAL
480.080000	27.30	20.1	47.0	19.7	---	0.0	0.00	VERTICAL
961.200000	42.10	27.5	47.0	4.9	---	0.0	0.00	VERTICAL

4.2. Electrostatic discharge

For test instruments and accessories used see section 3.6.

4.2.1. Description of the test location and date

Test location: 1# EMC Test Room

Date of test: Mar. 27, 2018

Operator: NADA

4.2.2. Severity levels of electrostatic discharge

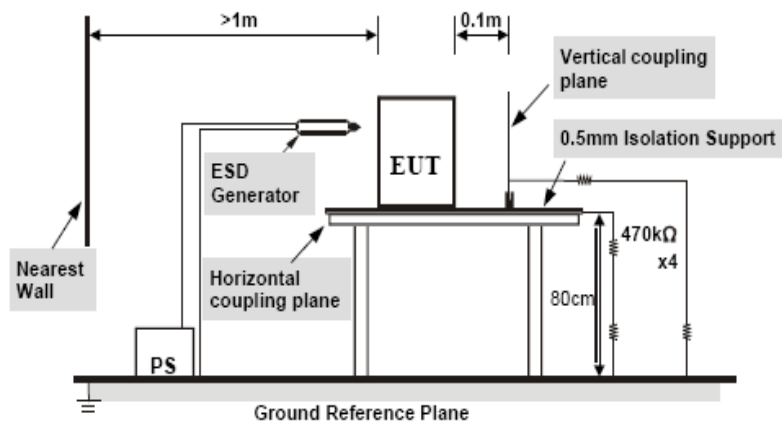
Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1	2	2
2	4	4
3	6	8
4	8	15
X	Special	Special

4.2.3. Description of the test set-up

4.2.3.1. Operating Condition

The EUT is set to work shall be carried out with normal working mode during the test, and the maximum emanating results are recorded.

4.2.3.2. Configuration of test setup

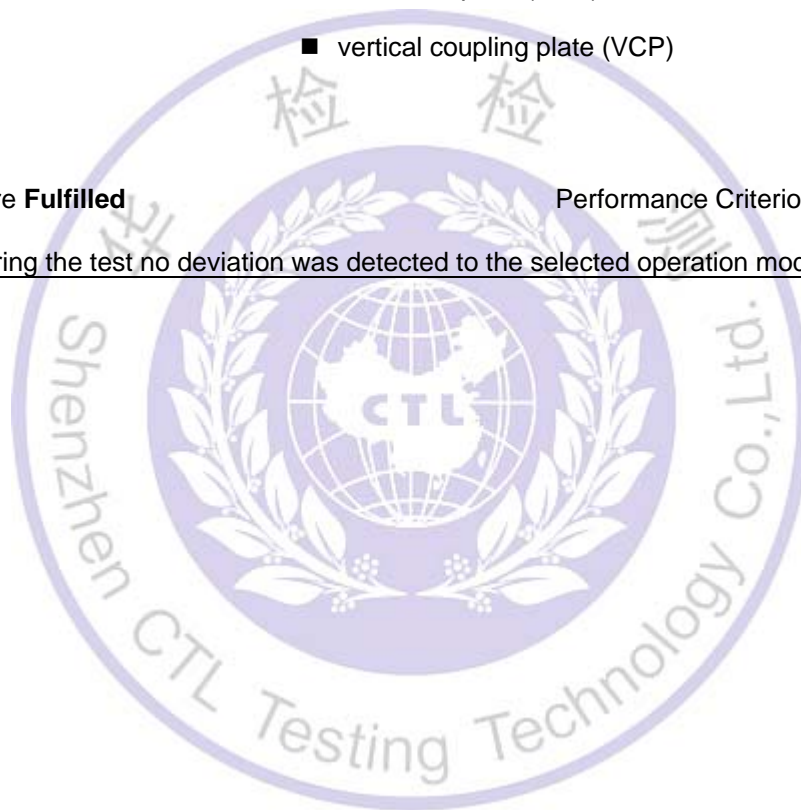


4.2.4. Test specification:Contact discharge voltage:☒ 2 kV ☒ 4 kVAir discharge voltage:☒ 2 kV ☒ 4 kV ☒ 8 kVNumber of discharges:☐ ≥ 10 ☒ ≥ 25 Type of discharge:

Direct discharge

☒ Air discharge☒ Contact discharge

Indirect discharge

☒ Contact dischargePolarity:☒ Positive☒ NegativeDischarge location:☒ see photo documentation of the test set-up☒ all external locations accessible by hand☒ horizontal plate (HCP)☒ vertical coupling plate (VCP)**4.2.5. Test result**The requirements are **Fulfilled**Performance Criterion: **B****Remarks:**During the test no deviation was detected to the selected operation mode(s).

4.3. Radiated, radio-frequency, electromagnetic field

For test instruments and accessories used see section 3.6.

4.3.1. Description of the test location and date

Test location: Chamber 2

Date of test: Mar. 27, 2018

Operator: Bove

4.3.2. Severity levels of radiated, radio-frequency, electromagnetic field

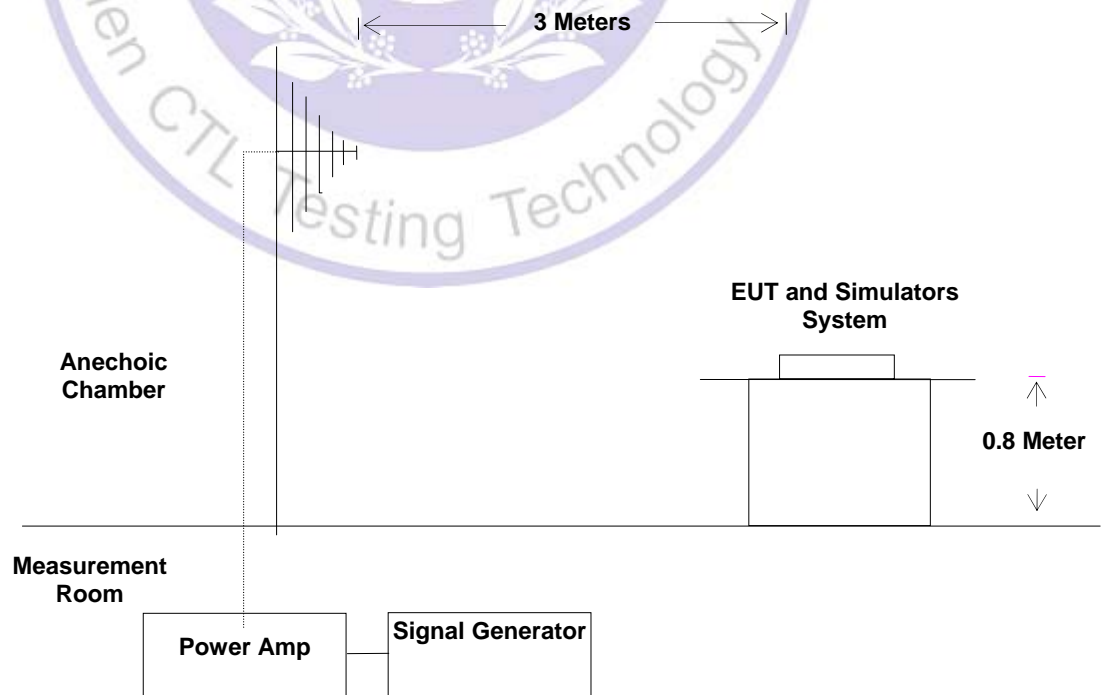
Level	Field Strength (V/m)
1.	1
2.	3
3.	10
X	Special

4.3.3. Description of the test set-up

4.3.3.1. Operating Condition

The EUT is set to work shall be carried out normal working mode during the test, and the maximum emanating results are recorded.

4.3.3.2. Configuration of test setup



4.3.4. Test specification:

<u>Frequency range:</u>	■ 80 MHz to 1000 MHz
<u>Field strength:</u>	■ 3 V/m
<u>EUT - antenna separation:</u>	■ 3 m
<u>Modulation:</u>	■ AM: 80 % ■ sinusoidal 1000Hz
<u>Frequency step:</u>	■ 1 % with 3 s dwell time
<u>Antenna polarisation:</u>	■ horizontal ■ vertical

4.3.5. Test result

The requirements are **Fulfilled**

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).



4.4. Magnetic Field Immunity

For test instruments and accessories used see section 3.6.

4.4.1. Description of the test location

Test location: 2# EMC Test Room

Date of test: Mar. 27, 2018

Operator: Andy

4.4.2. Severity levels of magnetic field immunity

Level	Magnetic Field Strength (A/m)
1	1
2	3
3	10
4	30
5	100
X.	Special

4.4.3. Description of the test set-up

4.4.3.1. Operating Condition

The EUT is set to work shall be carried out normal working mode during the test, and the maximum emanating results are recorded.

4.4.4. Test specification:

Test frequency:

■ 50 Hz

Continuous field:

■ 1 A/m

Test duration:

■ 5 Minutes

Antenna factor:

0.917 A/m

Axis:

■ x-axis

■ y-axis

■ z-axis

4.4.5. Test result

The requirements are **Fulfilled**

Performance Criterion: **A**

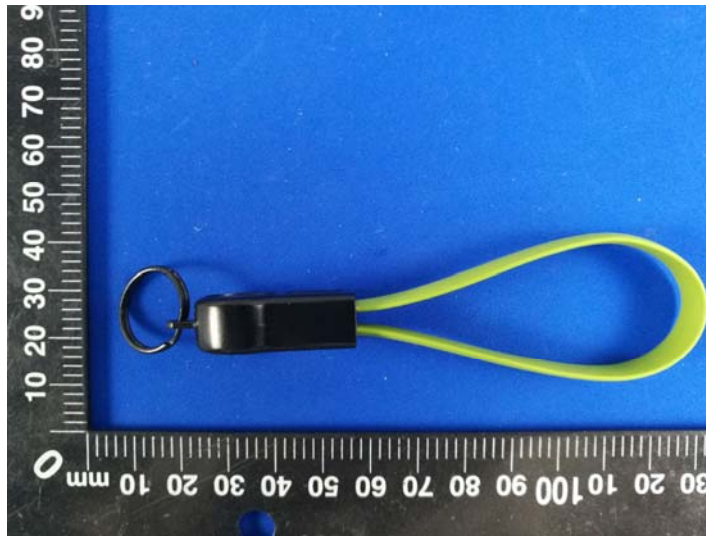
Remarks: During the test no deviation was detected to the selected operation mode(s).

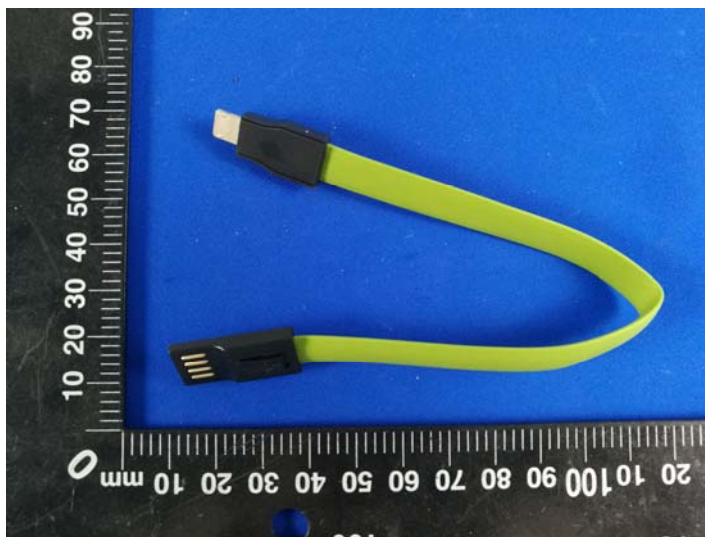
5. Test Setup Photos





6. Photos of the EUT





..... End Of Report.....

