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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. : CTL1801256011-E

Compiled by
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Date of issue : Feb. 01, 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.

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Test item description..... : CHARGING CABLE

Trade Mark..... : Spector&co

Test voltage : DC 5V

Result..... : Pass

EMC -- Test Report

Test Report No. :	CTL1801256011-E	Feb. 01, 2018
		Date of issue

Equipment under Test : CHARGING CABLE

Type / Model : T985

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
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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
CTL1801256011-E	V1.0	Initial Issued Report	Feb. 01, 2018



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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 : Jan. 26, 2018

Testing commenced on : Jan. 26, 2018

Testing concluded on : Feb. 01, 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

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 22/EN 55032 requirements.

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.
2. “#” indicates the testing item(s) was(were) fulfilled by subcontracted lab.

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	30~1000MHz	±3.56dB	(1)
Radiated Emission	1~12.75GHz	±4.32dB	(1)
Conducted Emission	0.15~30MHz	±2.66dB	(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 2)						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	ULTRA-BROADBAND ANT ENNA	Schwarzbeck	VULB 9168	00824	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	HEWLETT PACKARD	8648C	3642U01765	2017/10/10	2018/10/09
2	Power Amplifier	Agilent	E9301A	MY41497845	2017/10/10	2018/10/09
3	Power Meter	Agilent	E4419B	GB43317877	2017/10/10	2018/10/09
4	Directional Coupler	EMtrace	DDC-0210-150W	N/A	2017/10/13	2018/10/12
5	Test Antenna-Bi-Log	Schwarzbeck	VULB 9118 E	N/A	2017/10/10	2018/10/09

Power Frequency Magnetic Field Susceptibility Test						
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.

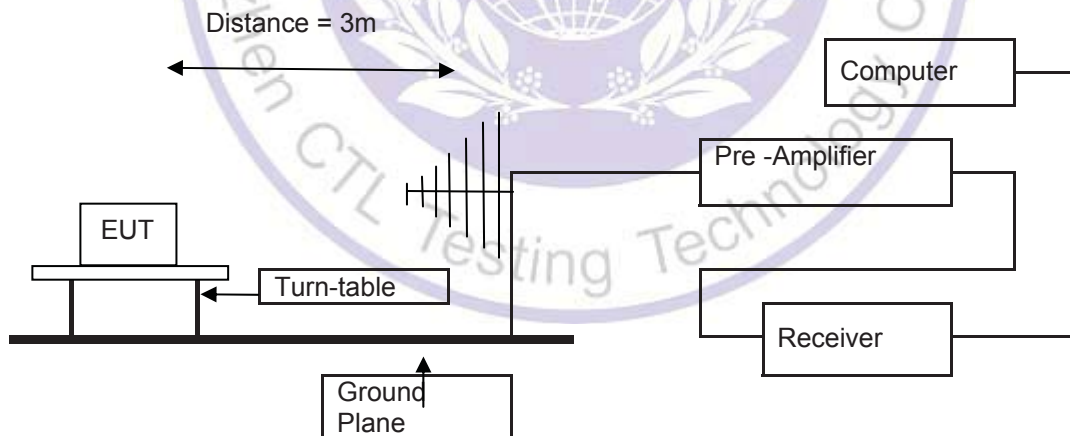
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

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).

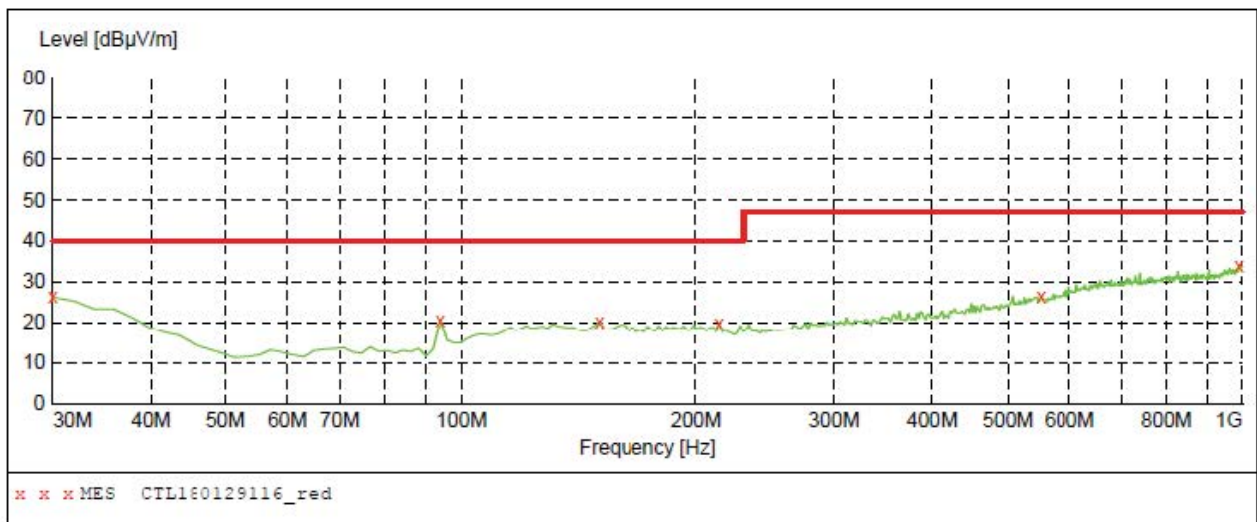
Shenzhen CTL Testing Technology Co.,Ltd

Radiation Emission Test EN 55032

EUT: T985
 Manufacturer:
 Operating Condition: WORKING
 Test Site: Chamber2
 Operator: ZBS
 Test Specification: /
 Comment:
 Start of Test: 1/29/2018 / 2:50:21PM

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

Short Description:		Field Strength			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	MaxPeak	300.0 ms	100 kHz	VULB 9168
30.0 MHz	1.0 GHz				



MEASUREMENT RESULT: "CTL180129116_red"

1/29/2018 2:51PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	26.20	22.1	40.0	13.8	---	0.0	0.00	HORIZONTAL
94.020000	20.40	9.8	40.0	19.6	---	0.0	0.00	HORIZONTAL
150.280000	20.20	14.4	40.0	19.8	---	0.0	0.00	HORIZONTAL
214.300000	19.80	14.4	40.0	20.2	---	0.0	0.00	HORIZONTAL
551.860000	26.50	21.9	47.0	20.5	---	0.0	0.00	HORIZONTAL
990.300000	33.90	28.0	47.0	13.1	---	0.0	0.00	HORIZONTAL

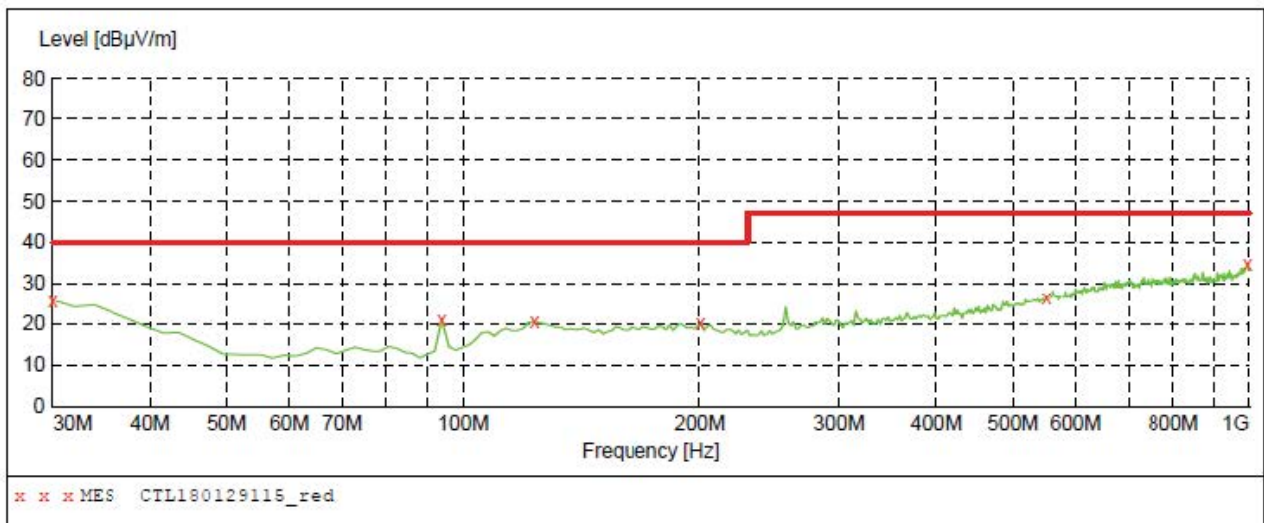
Shenzhen CTL Testing Technology Co.,Ltd

Radiation Emission Test EN 55032

EUT: T985
 Manufacturer:
 Operating Condition: WORKING
 Test Site: Chamber 2
 Operator: ZBS
 Test Specification: /
 Comment:
 Start of Test: 1/29/2018 / 2:47:49PM

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

Short Description:		Field Strength			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	MaxPeak			
30.0 MHz	1.0 GHz		300.0 ms	100 kHz	VULB 9168



MEASUREMENT RESULT: "CTL180129115_red"

1/29/2018 2:49PM

Frequency	Level	Transd	Limit	Margin	Det.	Height	Azimuth	Polarization
MHz	dBuV/m	dB	dBuV/m	dB		cm	deg	
30.000000	25.70	22.1	40.0	14.3	---	0.0	0.00	VERTICAL
94.020000	21.00	9.8	40.0	19.0	---	0.0	0.00	VERTICAL
123.120000	20.40	15.2	40.0	19.6	---	0.0	0.00	VERTICAL
200.720000	20.10	14.7	40.0	19.9	---	0.0	0.00	VERTICAL
551.860000	26.40	21.9	47.0	20.6	---	0.0	0.00	VERTICAL
996.120000	34.70	28.1	47.0	12.3	---	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: Feb. 01, 2018

Operator: NADA

4.2.2. Severity levels of electrostatic discharge

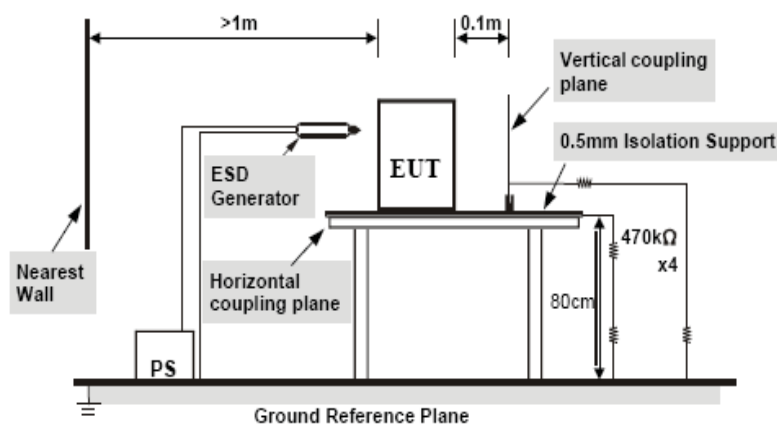
Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1	2	2
2	4	4
3	6	8
4	8	15
X	Special	Special

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 kV

Air discharge voltage: ■ 2 kV ■ 4 kV ■ 8 kV

Number of discharges:

≥ 10 ≥ 25

Type of discharge:

Direct discharge Air discharge
 Contact discharge
Indirect discharge Contact discharge

Polarity:

Positive Negative

Discharge location:

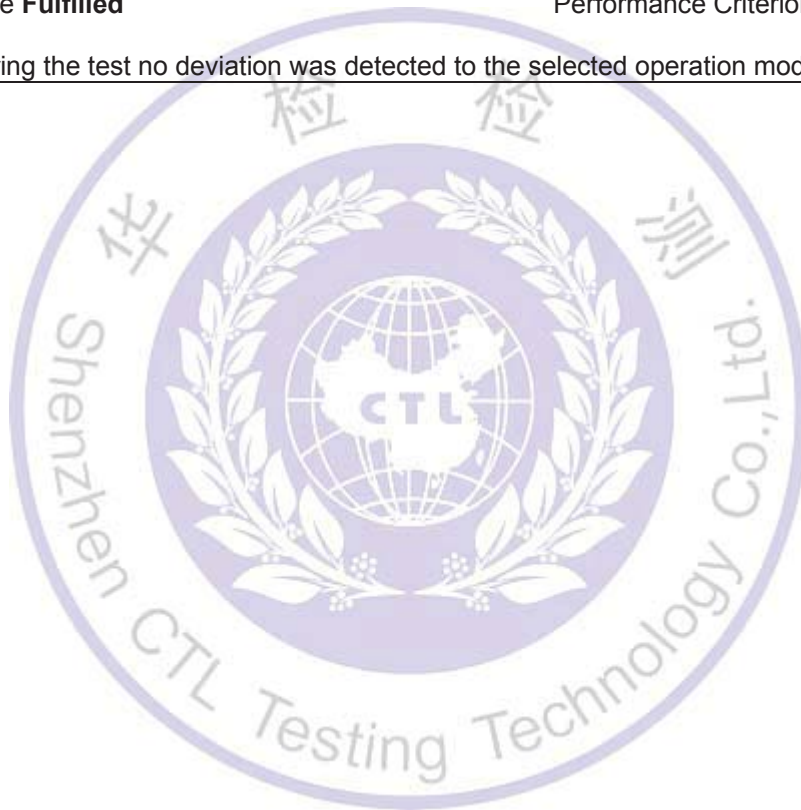
- see photo documentation of the test set-up
- all external locations accessible by hand
- horizontal plate (HCP)
- vertical coupling plate (VCP)

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: Subcontracted Lab

Date of test: Feb. 01, 2018

Operator: Bove

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

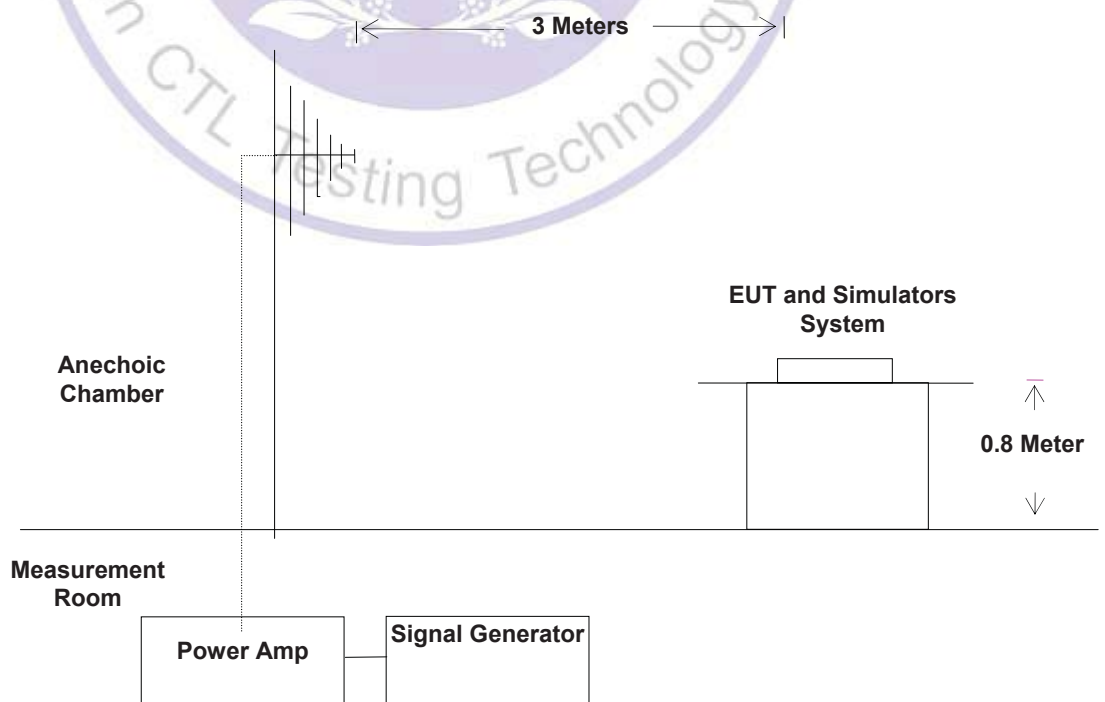
Level	Field Strength (V/m)
1.	1
2.	3
3.	10
X	Special

4.3.3. Description of the test set-up

4.3.3.1. Operating Condition

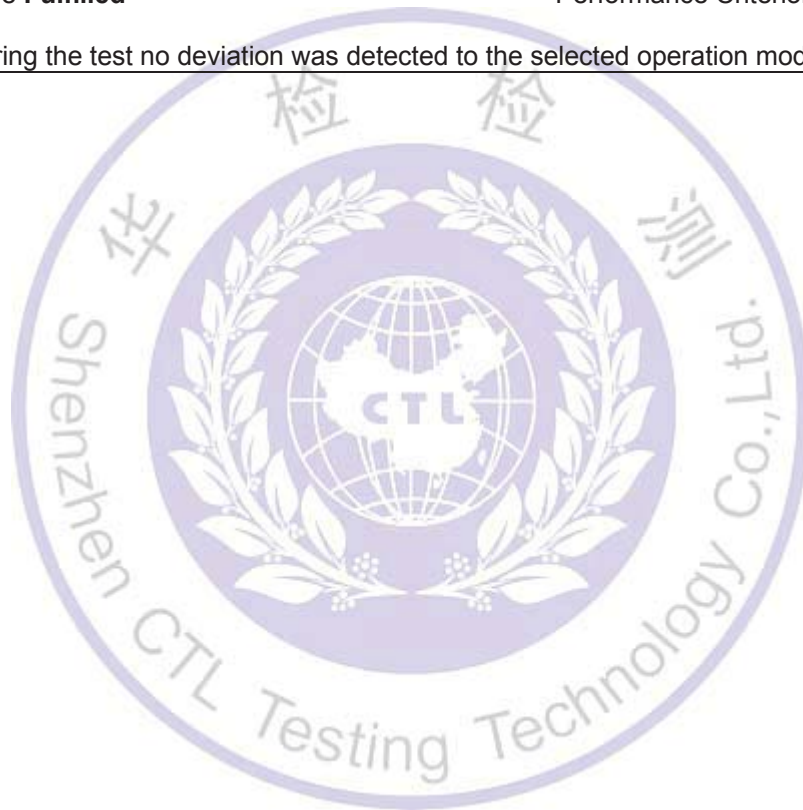
The EUT is set to work shall be carried out normal working mode during the test, and the maximum emanating results are recorded.

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 resultThe 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: Feb. 01, 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

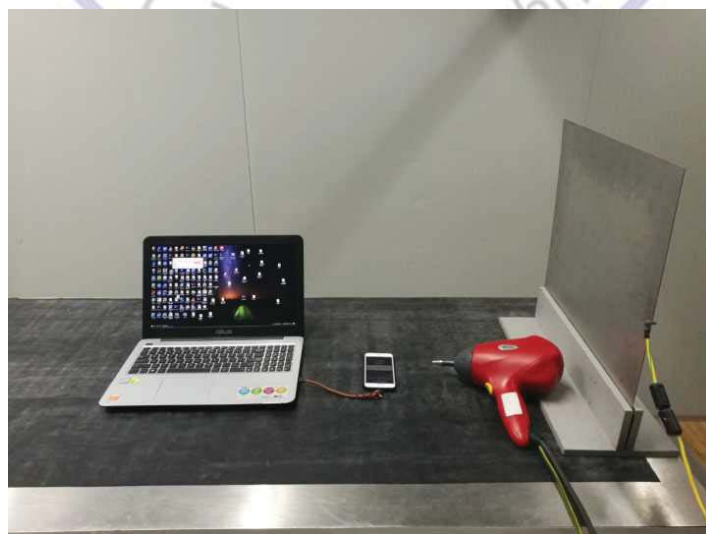
4.4.5. Test result

The requirements are **Fulfilled**

Performance Criterion: **A**

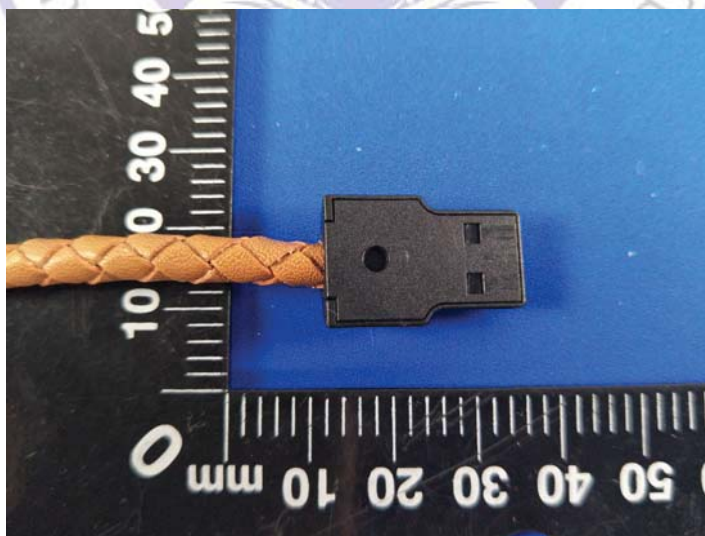
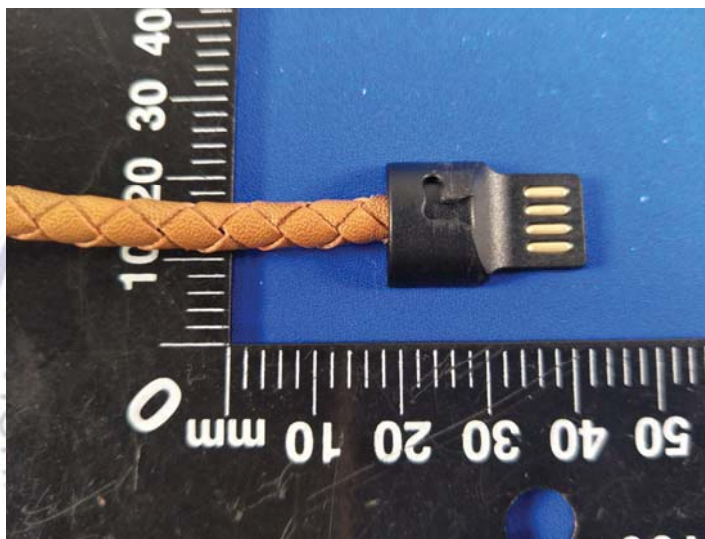
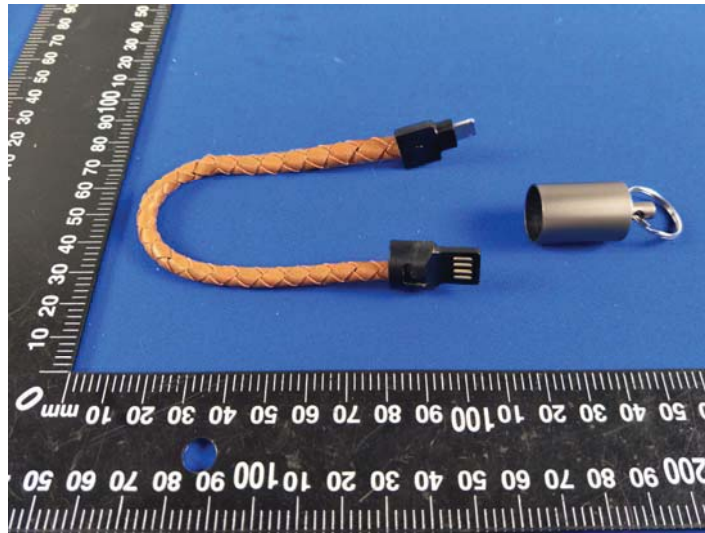
Remarks: During the test no deviation was detected to the selected operation mode(s).

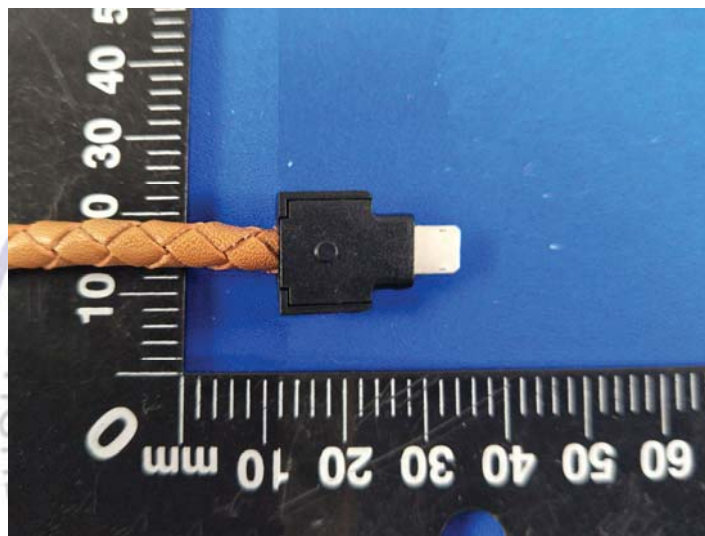
5. Test Setup Photos

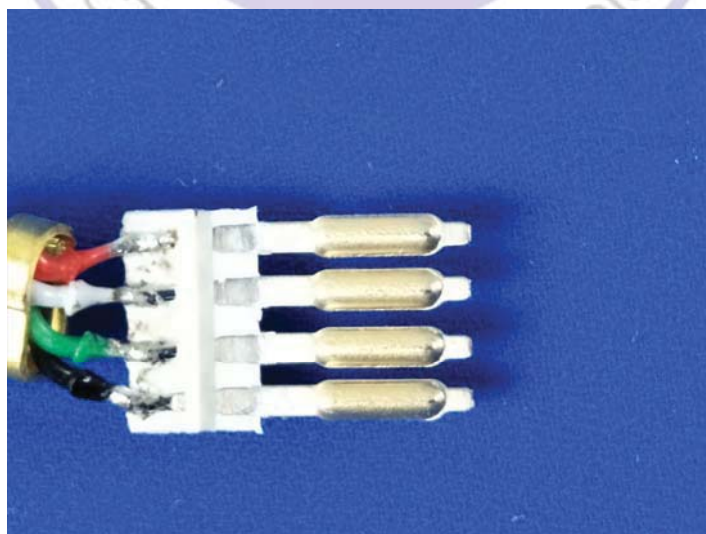
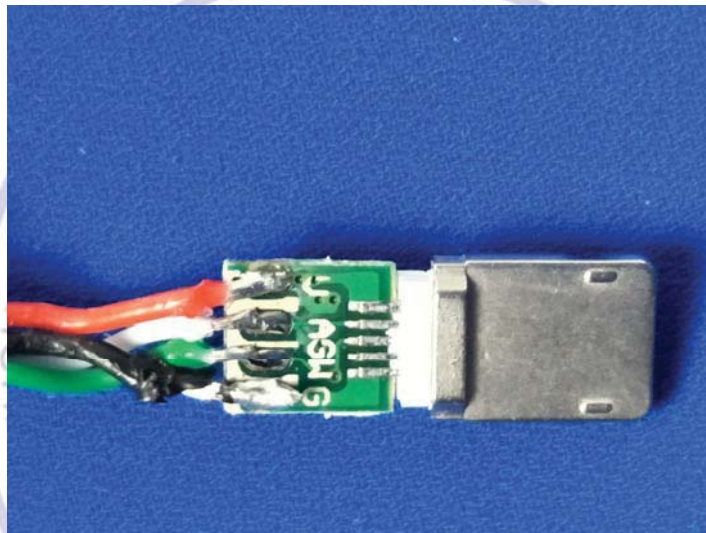
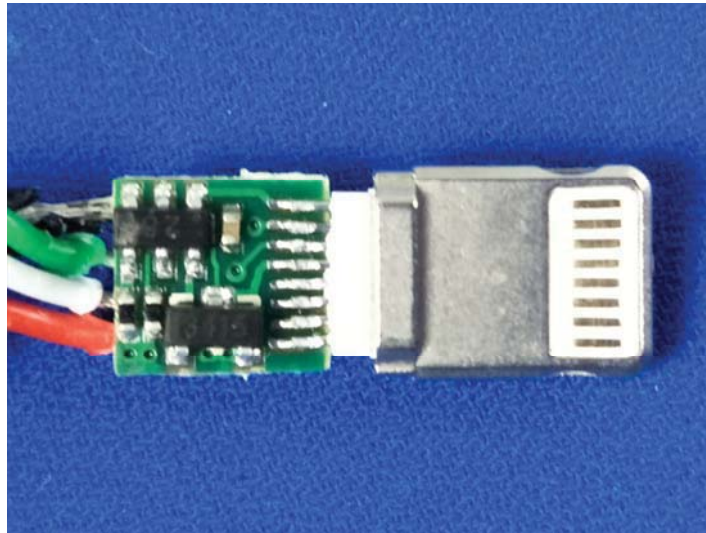


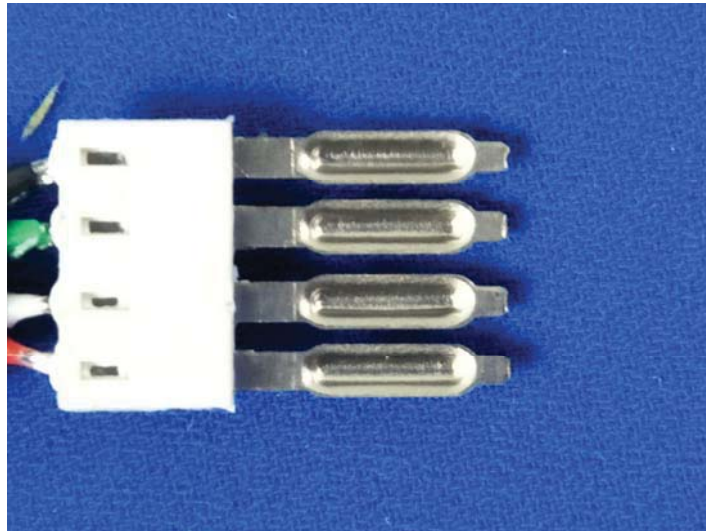
6. Photos of the EUT











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

