CE EMC Test Report

(Declaration of Conformity)

For

Electromagnetic Interference

Of

Product： Universal Smart LCD NiMH Charger

Trade Mark： Vapex

Model Number： VTE-10000

Prepared for

Vapex Technology Limited

Room 1103, 11/F, Hang Seng Mongkok building, 677 Nathan Road, Mongkok, Kowloon, Hongkong

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name ..... :	Vapex Technology Limited
Address ..... :	Room 1103, 11/F, Hang Seng Mongkok building, 677 Nathan Road, Mongkok, Kowloon, Hongkong
Manufacturer's Name ..... :	Ray Meida Electronic (Shenzhen) Company Limited
Address ..... :	3F, 4th Building,Jinxiu Industry Zone, Xitian, Gongming Town,Shenzhen, China

Product description

Product name..... :	Universal Smart LCD NiMH Charger
Model and/or type reference :	VTE-10000
Standards ..... :	EN 55014-1: 2006+A1:2009+A2: 2011 EN 55014-2: 1997+A1: 2001+A2: 2008 EN 61000-3-2: 2006+A1: 2009+A2: 2009 EN 61000-3-3: 2013

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the 2004/108/EC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test.....:	
Date (s) of performance of tests.....:	06 Nov. 2014 ~27 Nov. 2014
Date of Issue .....:	27 Nov. 2014
Test Result .....:	**Pass**

Testing Engineer : 

(Mary Hu)

Technical Manager : 

(Eileen Liu)

Authorized Signatory : 

(Bill Yao)

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1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN 55014-1: 2006+A1:2009+A2: 2011	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	
EN61000-3-2: 2006+A2: 2009	Harmonic Current Emission	Class A or D NOTE (2)	PASS	
EN 61000-3-3: 2013	Voltage Fluctuations & Flicker	------	PASS	
EMC Immunity				
Section EN55014-2: 1997+A1: 2001+A2: 2008	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2: 2009	Electrostatic Discharge	B	PASS	
EN 61000-4-3:2006+A1:2008+A2: 2010	RF electromagnetic field	A	PASS	
EN 61000-4-4: 2012	Fast transients	B	PASS	
EN 61000-4-5: 2006	Surges	B	PASS	
EN 61000-4-6: 2012	Injected Current	A	PASS	
EN 61000-4-11: 2004	Volt. Interruptions Volt. Dips	C / C / C **NOTE (3)**	PASS	

NOTE:

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

(2) No limits apply for equipment with an active input power up to and including 75W.

(3)Voltage dip: 100% reduction – Performance Criteria **C**

Voltage dip: 30% reduction – Performance Criteria **C**

Voltage dip: 60% reduction – Performance Criteria **C**

For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd.
Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.
FCC Registration Number: 238937; IC Registration Number: 9270A-1
CNAS Registration Number: L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**, where expended 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. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
NTEKC01	ANSI	150 KHz ~ 30MHz	3.6	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
NTEKA01	ANSI	30MHz ~ 1000MHz	4.8	
		1GHz ~6GHz	4.5	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Universal Smart LCD NiMH Charger
Model Name	VTE-10000
Additional Model Number(s)	N/A
Model Difference	N/A
Product Description	The EUT is a Universal Smart LCD NiMH Charger). Operating frequency: N/A Connecting I/O port: N/A Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an Household Device. More details of EUT technical specifications, please refer to the User's Manual.
Power Source	DC Voltage
Power Rating	Input: 12-18VDC, 9W Output: D-4x(1.5Vdc 800mA) C-4x(1.5Vdc 800mA) AA-4x(1.5Vdc 800mA) AAA-4x(1.5Vdc 800mA) 9V Cell 2x (9Vdc, 50mA) Noted: EU approved power supply provided;

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible 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	Charging

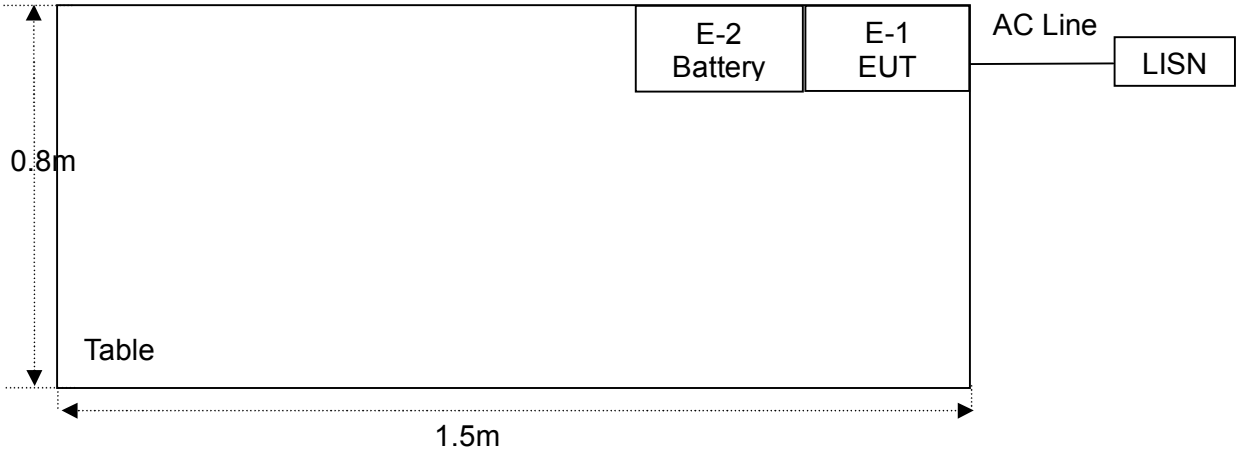
For Conducted Test	
Final Test Mode	Description
Mode 1	Charging

For Radiated Test	
Final Test Mode	Description
Mode 1	Charging

For EMS Test	
Final Test Mode	Description
Mode 1	Charging

2.3 DESCRIPTION OF TEST SETUP

Mode CE: Charging



2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

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	Brand	Model/Type No.	Series No.	Note
E-1	Universal Smart LCD NiMH Charger	Vapex	VTE-10000	N/A	EUT
E-2	Battery	N/A	N/A	N/A	

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) 'YES' means 'shielded' 'with core'; 'NO' means 'unshielded' 'without core'.

2.5 MEASUREMENT INSTRUMENTS LIST

2.5.1 CONDUCTED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	LISN	R&S	ENV216	101313	Jul. 06, 2014	Jul. 06, 2015	1 year
2	LISN	R&S	ENV216	111315	Jul. 06, 2014	Jul. 06, 2015	1 year
3	50Ω Switch	ANRITSU CORP	MP59B	6200983704	Jun. 16, 2014	Jun. 15, 2015	1 year
4	Test Cable	N/A	C01	N/A	Jun. 16, 2014	Jun. 15, 2015	1 year
5	Test Cable	N/A	C02	N/A	Jun. 16, 2014	Jun. 15, 2015	1 year
6	Test Cable	N/A	C03	N/A	Jun. 16, 2014	Jun. 15, 2015	1 year
7	EMI Test Receiver	R&S	ESCI	101160	Jun. 16, 2014	Jun. 15, 2015	1 year
8	Triple-Loop Antenna	EVERFINE	LIA-2	11020003	Jun. 18, 2014	Jun. 17, 2015	1 year
9	Absorbing Clamp	R&S	MDS-21	100423	Jun. 16, 2014	Jun. 15, 2015	1 year

2.5.2 RADIATED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Bilog Antenna	TESEQ	CBL6111D	31216	Jun. 16, 2014	Jun. 15, 2015	1 year
2	Test Cable	N/A	R-01	N/A	Jun. 16, 2014	Jun. 15, 2015	1 year
3	Test Cable	N/A	R-02	N/A	Jun. 16, 2014	Jun. 15, 2015	1 year
4	EMI Test Receiver	R&S	ESCI-7	101318	Jun. 16, 2014	Jun. 15, 2015	1 year
5	Antenna Mast	EM	SC100_1	N/A	N/A	N/A	N/A
6	Turn Table	EM	SC100	060531	N/A	N/A	N/A
7	50Ω Switch	Anritsu Corp	MP59B	6200983705	Jun. 16, 2014	Jun. 15, 2015	1 year
8	Spectrum Analyzer	Aglient	E4407B	MY45108040	Jun. 16, 2014	Jun. 15, 2015	1 year
9	Horn Antenna	EM	EM-AH-10180	2011071402	Jun. 16, 2014	Jun. 15, 2015	1 year
10	Amplifier	EM	EM-30180	060538	Jun. 16, 2014	Jun. 15, 2015	1 year

2.5.3 HARMONICS AND FILCK

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Harmonic & Flicker	EM TEST	DPA500	0303-04	Jun. 18, 2014	Jun. 17, 2015	1 year
2	AC Power Source	EM TEST	ACS500	0203-01	Jun. 18, 2014	Jun. 17, 2015	1 year

2.5.4 ESD

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	ESD TEST GENERATOR	SCHAFFNER	NSG438	859	Jun. 16, 2014	Jun. 15, 2015	1 year

2.5.5 RS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Signal Generator	R&S	SMT 06	832080/007	Jul. 24, 2014	Jul. 23, 2015	1 year
2	Log-Bicon Antenna	Schwarzbeck	VULB9161	4022	Jul. 24, 2014	Jul. 23, 2015	1 year
3	Power Amplifier	AR	150W1000M1	320946	Jul. 24, 2014	Jul. 23, 2015	1 year
4	Microwave Horn Antenna	AR	AT4002A	321467	Jun. 11, 2014	Jun. 10, 2015	1 year
5	Power Amplifier	AR	25S1G4A	308598	Jul. 24, 2014	Jul. 23, 2015	1 year

2.5.6 SURGE, EFT/BURST, VOLTAGE INTERRUPTION/DIPS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Surge Generator	EVERFINE	EMS61000-5A	1101002	Jun. 16, 2014	Jun. 15, 2015	1 year
2	DIPS Generator	EVERFINE	EMS61000-11K	1011002	Jun. 16, 2014	Jun. 15, 2015	1 year
3	EFT/B Generator	EVERFINE	EMS61000-4A-V2	1012005	Jun. 16, 2014	Jun. 15, 2015	1 year

2.5.7 INJECTION CURRENT

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Signal Generator	IFR	2023A	202301/368	Mar. 31, 2014	Mar. 30, 2015	1 year
2	Power Amplifier	AR	75A250AM1	0320709	Sep. 23, 2014	Sep. 22, 2015	1 year
3	CDN	FCC	FCC-801-M2	06043	Jun. 02, 2014	Jun. 01, 2015	1 year
4	EM Clamp	FCC	F-203I-23MM	504	Jun. 09, 2014	Jun. 08, 2015	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

Frequency Range (MHz)	At mains terminals		At load terminals and additional terminals	
	Quasi-peak (dBuV)	Average (dBuV)	Quasi-peak (dBuV)	Average (dBuV)
0.15 -0.5	66 - 56 *	56 - 46 *	80.00	70.00
0.50 -5.0	56.00	46.00	74.00	64.00
5.0 -30.0	60.00	50.00	74.00	64.00

3.1.2 MAINS TERMINALS OF TOOLS

Frequency Range	Rated motor power not exceeding 700W		Rated motor power above 700W and not exceeding1 000 W		Rated motor power above 1 000 W	
(MHz)	dB (uV) Quasi-peak	dB (uV) Average**	dB (uV) Quasi-peak	dB (uV) Average**	dB (uV) Quasi-peak	dB (uV) Average**
0.15 -0.5	66.0 to 59.0*	59.0 to 49.0*	70.0 to 63.0*	63.0 to 53.0*	76.0 to 69.0*	69.0 to 59.0*
0.50 -5.0	59.0	49.0	63.0	53.0	69.0	59.0
5.0 -30.0	64.0	54.0	68.0	58.0	74.0	64.0

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of ' * ' marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

(3) '**' If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.

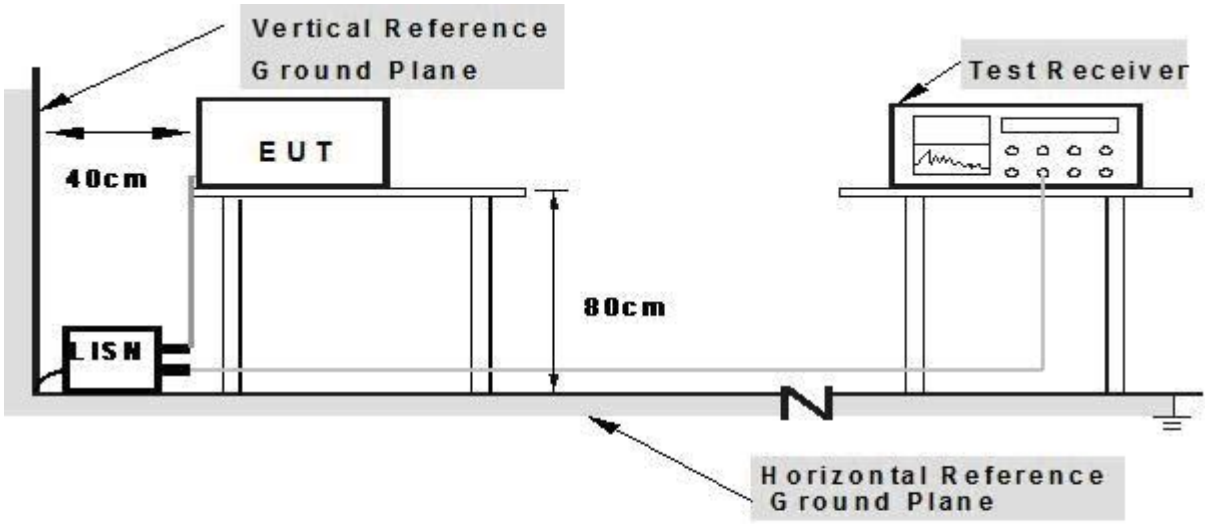
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.3 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
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.

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

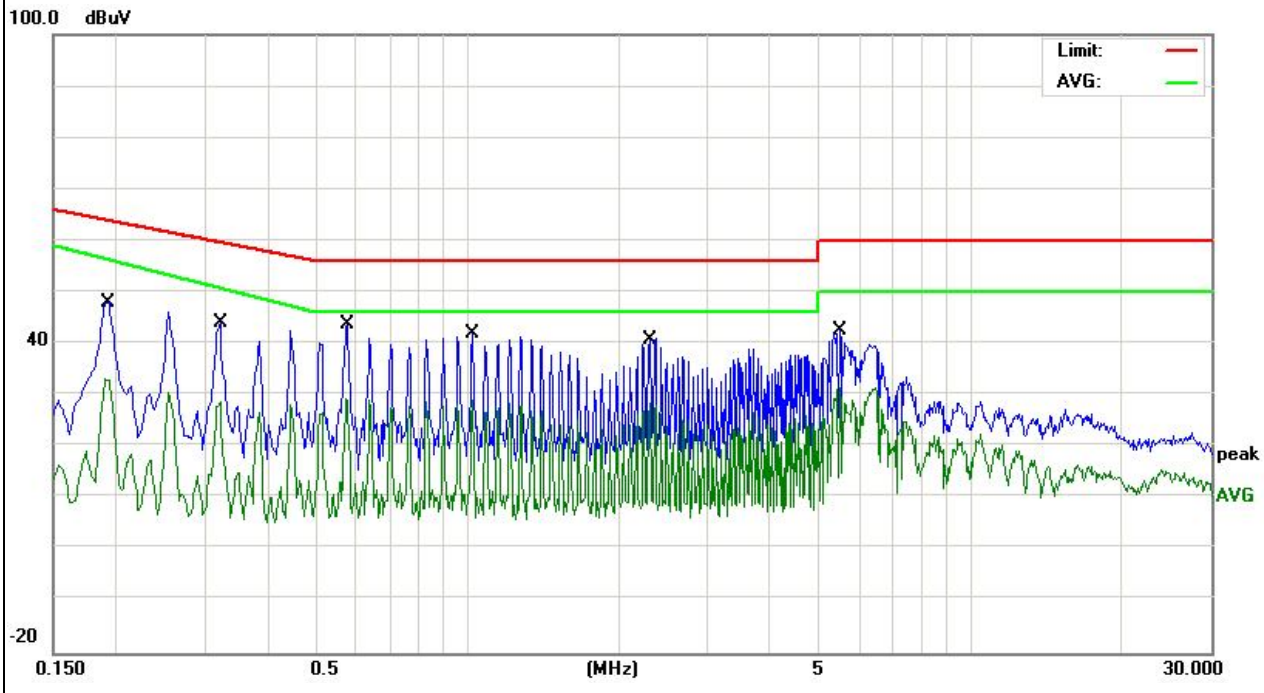
The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.1.6 TEST RESULTS

EUT：	Universal Smart LCD NiMH Charger	Model Name. ：	VTE-10000
Temperature：	26℃	Relative Humidity：	54%
Pressure：	1010hPa	Test Date：	2014-10-21
Test Mode：	Charging	Phase：	L
Test Voltage ：	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.1900	38.63	9.51	48.14	64.03	-15.89	QP
0.1900	23.65	9.51	33.16	56.44	-23.28	AVG
0.3220	34.53	9.50	44.03	59.65	-15.62	QP
0.3220	19.24	9.50	28.74	50.75	-22.01	AVG
0.5740	34.12	9.51	43.63	56.00	-12.37	QP
0.5740	19.92	9.51	29.43	46.00	-16.57	AVG
1.0220	32.52	9.53	42.05	56.00	-13.95	QP
1.0220	19.65	9.53	29.18	46.00	-16.82	AVG
2.3020	31.58	9.55	41.13	56.00	-14.87	QP
2.3020	18.85	9.55	28.40	46.00	-17.60	AVG
5.4940	32.83	9.62	42.45	60.00	-17.55	QP
5.4940	21.79	9.62	31.41	50.00	-18.59	AVG

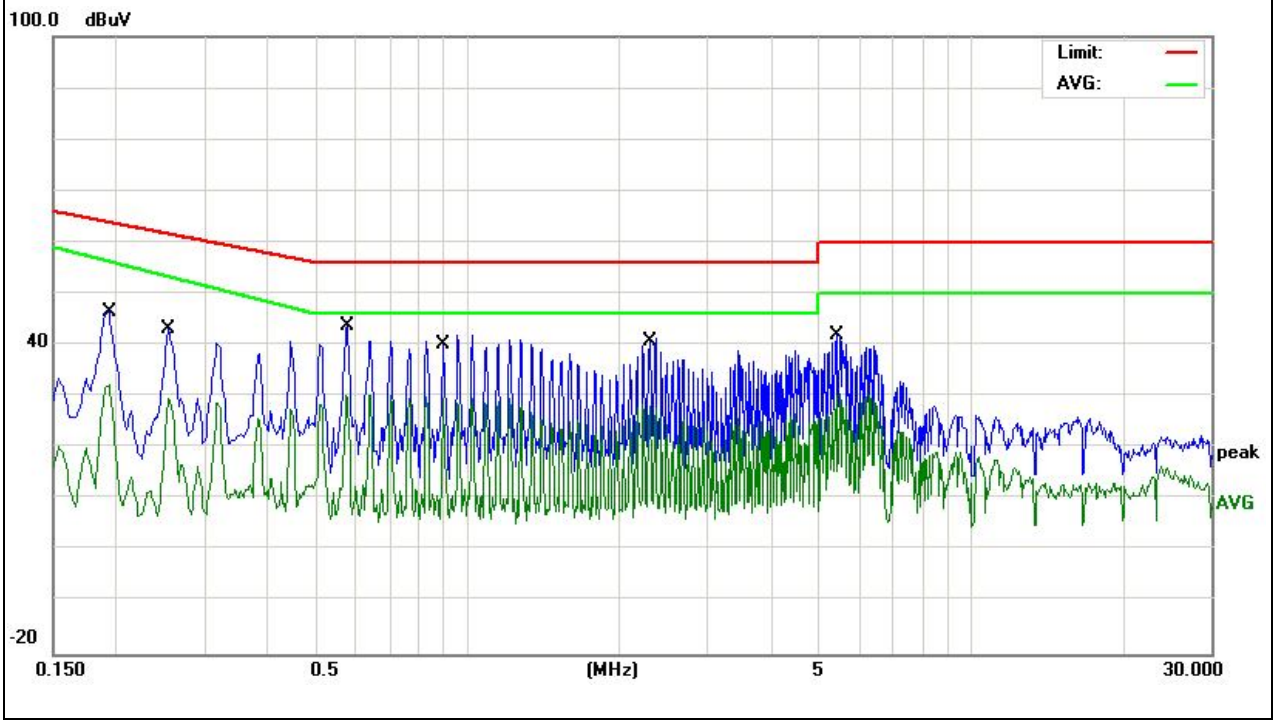
Remark:
Factor = Insertion Loss + Cable Loss.



EUT：	Universal Smart LCD NiMH Charger	Model Name. ：	VTE-10000
Temperature：	26℃	Relative Humidity：	54%
Pressure：	1010hPa	Test Date：	2014-10-21
Test Mode：	Charging	Phase：	N
Test Voltage ：	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.1940	36.83	9.52	46.35	63.86	-17.51	QP
0.1940	22.74	9.52	32.26	56.22	-23.96	AVG
0.2540	33.51	9.51	43.02	61.62	-18.60	QP
0.2540	20.21	9.51	29.72	53.31	-23.59	AVG
0.5740	34.12	9.53	43.65	56.00	-12.35	QP
0.5740	20.75	9.53	30.28	46.00	-15.72	AVG
0.8940	32.44	9.55	41.99	56.00	-14.01	QP
0.8940	20.09	9.55	29.64	46.00	-16.36	AVG
2.2980	31.90	9.57	41.47	56.00	-14.53	QP
2.2980	18.53	9.57	28.10	46.00	-17.90	AVG
5.4978	32.23	9.61	41.84	60.00	-18.16	QP
5.4978	21.04	9.61	30.65	50.00	-19.35	AVG

Remark:
Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	☐At 10m	☒At 3m
	dBuV/m	dBuV/m
30 – 230	30	40
230 – 1000	37	47

3.2.2 LIMITS OF DISTURBANCE POWER MEASUREMENT (Below 1000MHz)

	Household and similar appliances		Tools					
Frequency Range			Rated motor power not exceeding 700 W		Rated motor power above 700 W and not exceeding 1 000 W		Rated motor power above 1 000 W	
(MHz)	dB(pW) Quasi-peak	dB (pW) Average *	dB (pW) Quasi-peak	dB (pW) Average *	dB (pW) Quasi-peak	dB (pW) Average *	dB (pW) Quasi-peak	dB (pW) Average *
30-300	44-55	35-45	44-55	35-45	49-59	39-49	55-65	45-55
* If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.								

Notes:

(1) The limit for radiated test was performed according to as following: CISPR 14.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.3 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

c. 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.

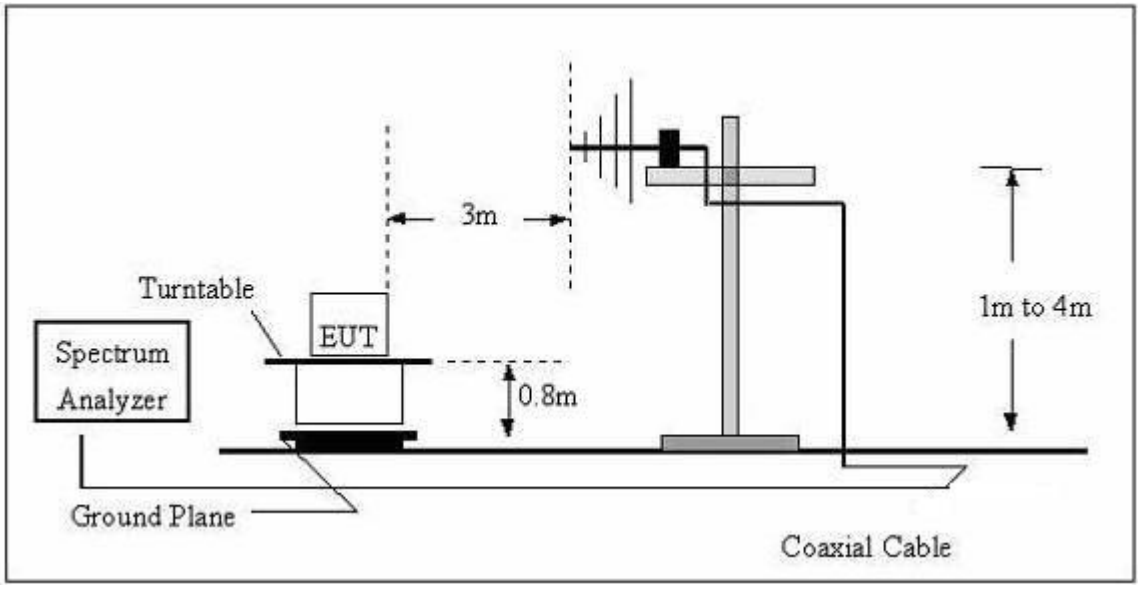
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.

e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.

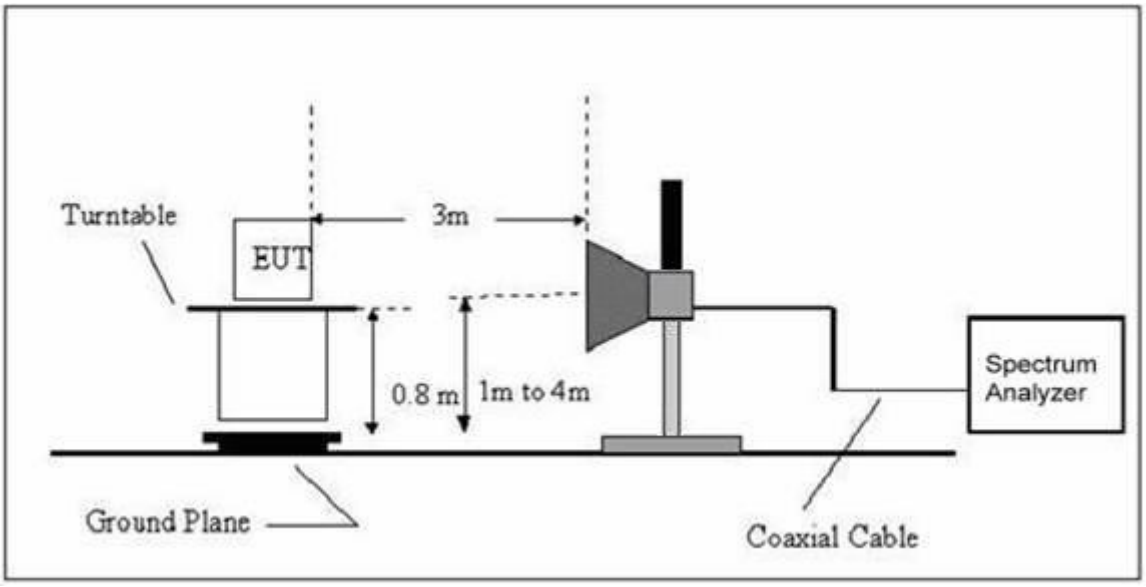
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.4 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz.



(B) Disturbance Power Test Set-UP Frequency Below 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (30MHz-1000MHz)

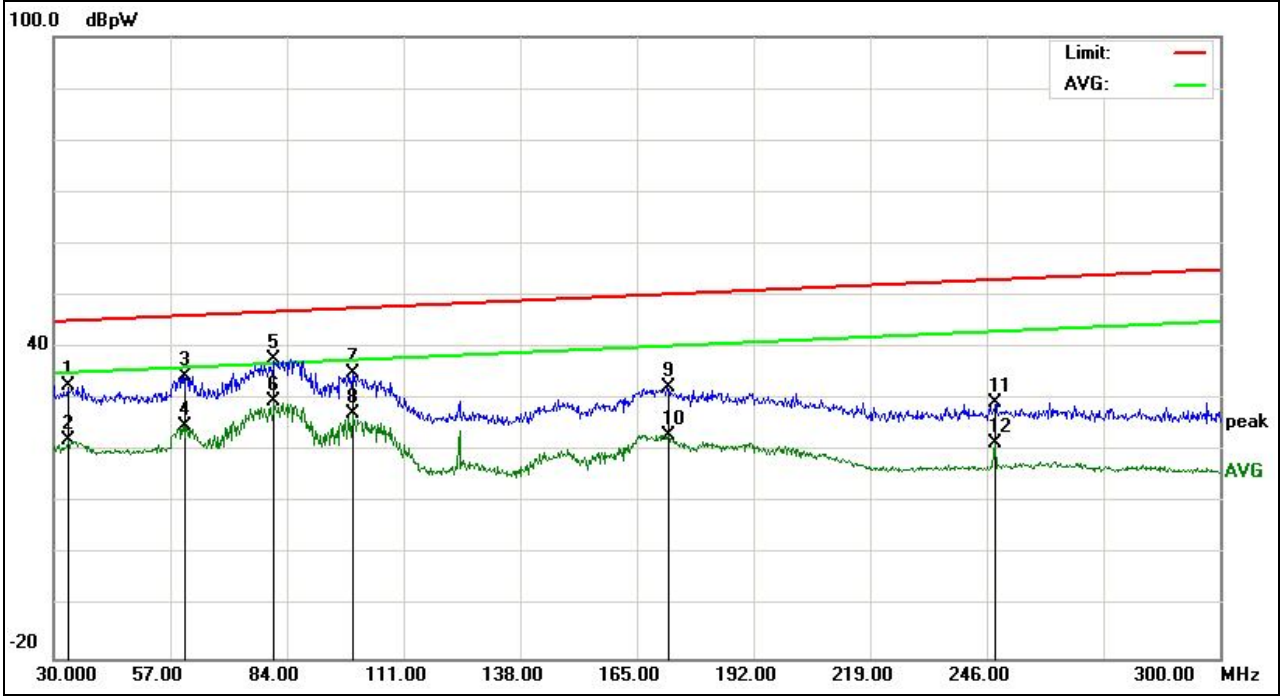
EUT：	Universal Smart LCD NiMH Charger	Model Name：	VTE-10000
Temperature：	24℃	Relative Humidity：	54%
Pressure：	1010hPa	Test Date：	N/A
Test Mode：	N/A	Polarization：	N/A
Test Power：	N/A		

3.2.7 TEST RESULTS (30MHz ~300MHz)

EUT：	Universal Smart LCD NiMH Charger	Model Name：	VTE-10000
Temperature：	24℃	Relative Humidity：	54%
Pressure：	1010hPa	Test Date：	2014-10-21
Test Mode：	Charging	Test Port：	AC Line
Test Power：	AC 230V/50Hz		

Freq. (MHz)	Reading (dBpW)	Factor (dBpW)	Measurement (dBpW)	Limit (dBpW)	Over (dB)	Detector
33.7599	4.35	28.42	32.77	45.14	-12.37	QP
33.7599	-6.16	28.42	22.26	35.14	-12.88	AVG
60.5199	6.44	27.95	34.39	46.13	-11.74	QP
60.5199	-2.99	27.95	24.96	36.13	-11.17	AVG
81.2000	11.38	26.45	37.83	46.90	-9.07	QP
81.2000	3.07	26.45	29.52	36.90	-7.38	AVG
99.1600	9.67	25.39	35.06	47.56	-12.50	QP
99.1600	1.72	25.39	27.11	37.56	-10.45	AVG
172.4400	7.99	24.38	32.37	50.28	-17.91	QP
172.4400	-1.26	24.38	23.12	40.28	-17.16	AVG
247.9599	3.84	25.41	29.25	53.07	-23.82	QP
247.9599	-3.76	25.41	21.65	43.07	-21.42	AVG

Remark:
Factor = Antenna Factor + Cable Loss - Amplifier.



3.3 HARMONICS CURRENT

3.3.1 LIMITS OF HARMONICS CURRENT

IEC 555-2					
Table - I			Table - II		
Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Ampers)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Ampers)
Non Portable Tools or TV Receivers	Odd Harmonics		TV Receivers	Odd Harmonics	
	3	2.30		3	0.80
	5	1.14		5	0.60
	7	0.77		7	0.45
	9	0.40		9	0.30
	11	0.33		11	0.17
	13	0.21		13	0.12
	15≤n≤39	0.15 · 15/n		15≤n≤39	0.10 · 15/n
	Even Harmonics			Even Harmonics	
	2	1.08		2	0.30
	4	0.43		4	0.15
	8	0.30			
	8≤n≤40	0.23 · 8/n		DC	0.05

EN 61000-3-2/IEC 61000-3-2					
Equipment Category	Max. Permissible Harmonic Current (in Ampers)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in A)	(mA/w)
Class A	Same as Limits Specified in 4-2.1, Table - I, but only odd harmonics required	Class D	3	2.30	3.4
			5	1.14	1.9
			7	0.77	1.0
			9	0.40	0.5
			11	0.33	0.35
			13≤n≤39	see Table I	3.85/n
			only odd harmonics required		

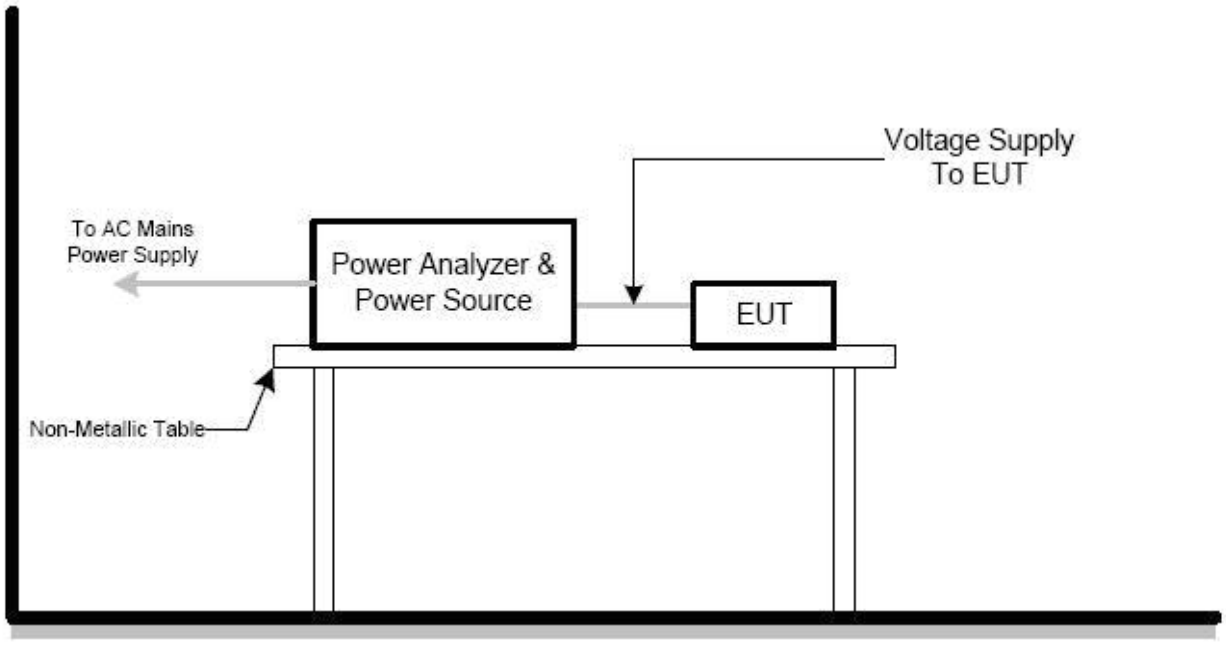
3.3.1.1TEST PROCEDURE

a. 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.
b. The classification of EUT is according to section 5 of EN 61000-3-2. The EUT is classified as follows:
Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.
Class B: Portable tools. Portable tools.; Arc welding equipment which is not professional equipment.
Class C: Lighting equipment.
Class D: Equipment having a specified power less than or equal to 600W of the following types: Personal computers and personal computer monitors and television receivers.
c. 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.

3.3.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.1.3 TEST SETUP



3.3.2 TEST RESULTS

EUT：	Universal Smart LCD NiMH Charger	Model Name：	VTE-10000
Temperature：	25℃	Relative Humidity：	45%
Pressure：	1010hPa	Test Date：	2014-10-21
Test Mode：	Charging		
Test Power：	AC 230V/50Hz		

Note: The active input power of the EUT is less than 75 W. No limits apply for equipment with an active input power up to and including 75W.

3.4 VOLTAGE FLUCTUATION AND FLICKERS

3.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKERS

Tests	Limits		Descriptions
	IEC555-3	IEC/EN 61000-3-3	
Pst	≤ 1.0, Tp= 10 min.	≤ 1.0, Tp= 10 min.	Short Term Flicker Indicator
Plt	N/A	≤ 0.65, Tp=2 hr.	Long Term Flicker Indicator
dc	≤ 3%	≤ 3.3%	Relative Steady-State V-Chang
dmax	≤ 4%	≤ 4%	Maximum Relative V-change
d (t)	N/A	≤ 3.3% for > 500 ms	Relative V-change characteristic

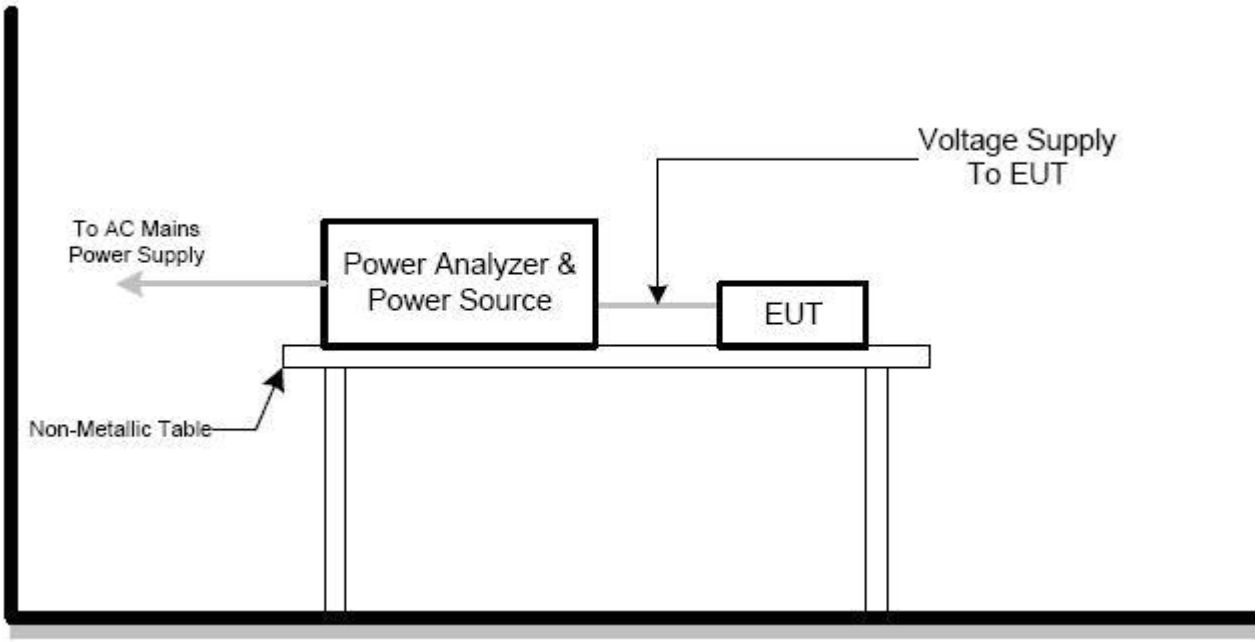
3.4.1.1TEST PROCEDURE

a. Harmonic Current Test:
Test was performed according to the procedures specified in Clause 5.0 of IEC555-2 and/or Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.
b. Fluctuation and Flickers Test:
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.
c. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

3.4.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.4.1.3 TEST SETUP



3.4.2 TEST RESULTS

EUT：	Universal Smart LCD NiMH Charger	Model Name：	VTE-10000
Temperature：	25℃	Relative Humidity：	45%
Pressure：	1010hPa	Test Date：	2014-10-21
Test Mode：	Charging		
Test Power：	AC 230V/50Hz		

Maximum Flicker results

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.006	3.30	PASS
dmax [%]	0.245	4.00	PASS
dt [s]	0.000	0.50	PASS

4. EMC IMMUNITY TEST

4.1 STANDARD COMPLIANCE/ SERVRITY LEVEL/ CRITERIA

Tests Standard No.	TEST SPECIFICATION	Test Mode Test Ports	Perform. Criteria
1. ESD IEC/EN 61000-4-2	8KV air discharge 4KV contact discharge	Direct Mode	B
	4KV HCP discharge 4KV VCP discharge	Indirect Mode	B
2. RS IEC/EN 61000-4-3	80 MHz to 1000 MHz, 1000Hz, 80%, AM modulated	Enclosure	A
3. EFT/Burst IEC/EN 61000-4-4	5/50ns Tr/Th 5KHz Repetition Freq.	Power Supply Port	B
	5/50ns Tr/Th 5KHz Repetition Freq.	CTL/Signal Data Line Port	B
4. Surges IEC/EN 61000-4-5	1.2/50(8/20) Tr/Th us	L-N	B
	1.2/50(8/20) Tr/Th us	L-PE N-PE	B
5 Injected Current IEC/EN 61000-4-6	0.15 MHz to 80 MHz, 1000Hz 80% , AM Modulated 150Ω source impedance	CTL/Signal Port	A
	0.15 MHz to 80 MHz, 1000Hz 80% , AM Modulated 150Ω source impedance	AC Power Port	A
	0.15 MHz to 80 MHz, 1000Hz 80% , AM Modulated 150Ω source impedance	DC Power Port	A
6. Power Frequency Magnetic Field IEC/EN 61000-4-8	50 Hz,	Enclosure	A
7. Volt. Interruptions Volt. Dips IEC/EN 61000-4-11	Voltage dip 100% Voltage dip 30% Voltage dip 60%	AC Power Port	C C C

4.2 GENERAL PERFORMANCE CRITERIA

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

Criterion A	The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. 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 by what the user may reasonably expect from the equipment if used as intended.
Criterion B	After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.
Criterion C	Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

4.3 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

4.4 ESD TESTING

4.4.1 TEST SPECIFICATION

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

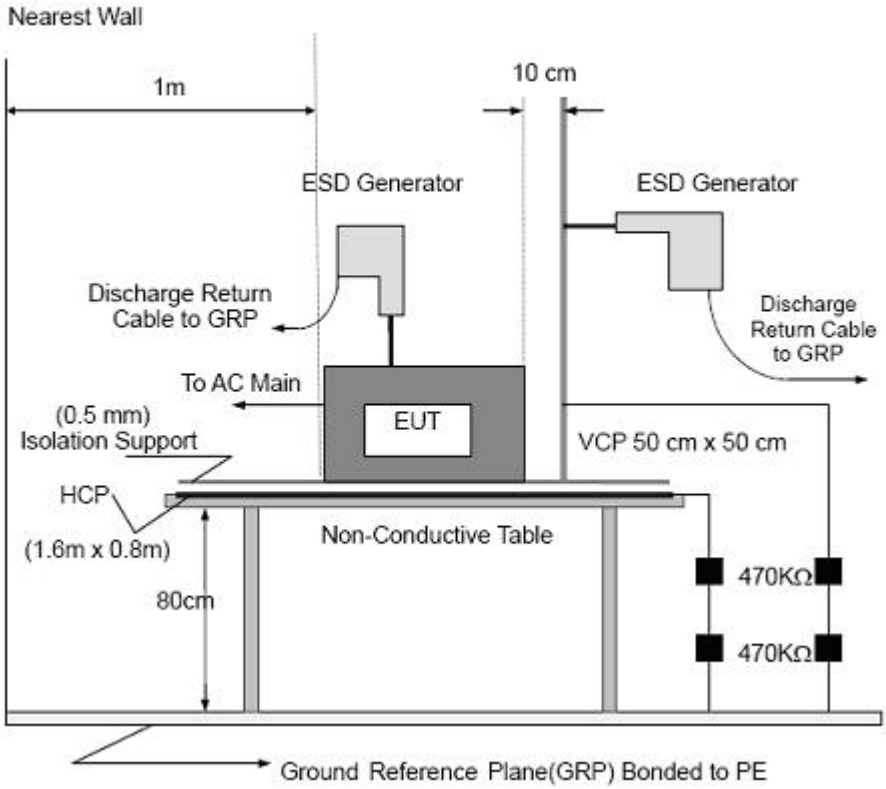
4.4.2 TEST PROCEDURE

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

a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT.
During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.
If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.
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.

4.4.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/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.

4.4.4 TEST RESULTS

EUT：	Universal Smart LCD NiMH Charger	Model Name：	VTE-10000
Temperature：	25℃	Relative Humidity：	45%
Pressure：	1010hPa	Test Date：	2014-10-22
Test Mode：	Charging		
Test Power：	AC 230V/50Hz		

Mode	Contact Discharge (Indirect)							Criterion	Result
Test level (kV)	Test Point	2		4		6			
Test Location		+	-	+	-	+	-		
HCP	Front			A	A			B	PASS
	Rear			A	A				PASS
	Left			A	A				PASS
	Right			A	A				PASS
VCP	Front			A	A				PASS
	Rear			A	A				PASS
	Left			A	A				PASS
	Right			A	A				PASS

Mode	Air Discharge								Contact Discharge								Criterion	Result
Test level (kV)	2		4		8		15		2		4		6		8			
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-		
A1	A	A	A	A	B	B											B	PASS
A2	A	A	A	A	B	B												PASS
C1											B	B						PASS

Note:

1) +/- denotes the Positive/Negative polarity of the output voltage.
2) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s).

4.5 RS TESTING

4.5.1 TEST SPECIFICATION

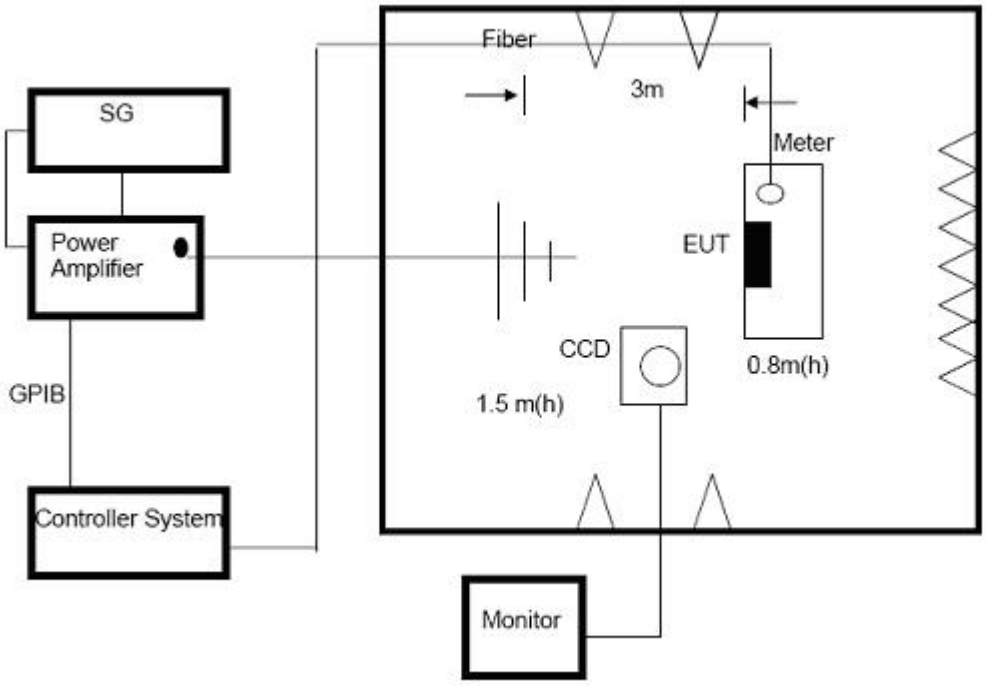
Basic Standard:	IEC/EN 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least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

4.5.2 TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.
The testing distance from antenna to the EUT was 3 meters.
The other condition as following manner:

a. The frequency range is swept from 80 MHz to 1000 MHz, & 1400MHz - 2700MHz with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
b. Sweep Frequency 900 MHz, with the Duty Cycle: 1/8 and Modulation: Pulse 217 Hz(if applicable)
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.

4.5.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

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

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 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.

4.5.4 TEST RESULTS

EUT：	Universal Smart LCD NiMH Charger	Model Name：	VTE-10000
Temperature：	25℃	Relative Humidity：	60%
Pressure：	1010hPa	Test Date：	2014-10-22
Test Mode：	Charging		
Test Power：	AC 230V/50Hz		

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Perform. Criteria	Results	Judgment
80MHz - 1000MHz	H / V	3 V/m (r.m.s.) AM Modulated 1000Hz, 80%	Front	**A**	**A**	**PASS**
			Rear			
			Left			
			Right			

Note:

1) N/A - denotes test is not applicable in this test report.
2) Criteria A: There was no change operated with initial operating during the test.
3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
4) Criteria C: The system shut down during the test.

4.6 EFT/BURST TESTING

4.6.1 TEST SPECIFICATION

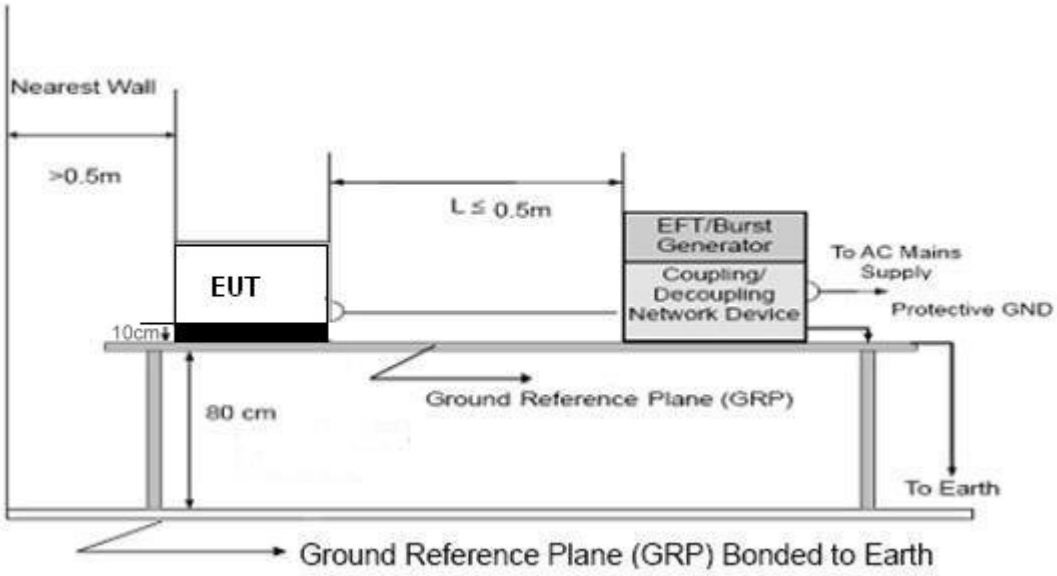
Basic Standard:	IEC/EN 61000-4-4
Required Performance	B
Test Voltage:	Power Line：0.5 KV, 1 kV Signal/Control Line：0.5 KV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 1 min.

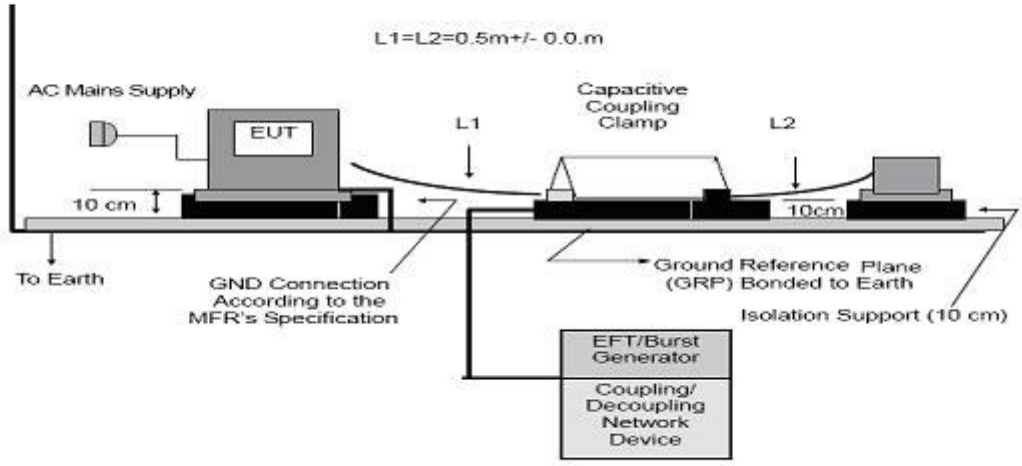
4.6.2 TEST PROCEDURE

The EUT and its simulators were placed on a ground reference plane and were insulated from it by a wood support 0.1m + 0.01m thick. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. The other condition as following manner:

a. The length of power cord between the coupling device and the EUT should not exceed 1 meter.
b. Both positive and negative polarity discharges were applied.
c. The duration time of each test sequential was 1 minute.

4.6.3 TEST SETUP





Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

4.6.4 TEST RESULTS

EUT：	Universal Smart LCD NiMH Charger	Model Name：	VTE-10000
Temperature：	25℃	Relative Humidity：	60%
Pressure：	1010hPa	Test Date：	2014-10-22
Test Mode：	Charging		
Test Power：	AC 230V/50Hz		

Coupling Line		Test level (kV)								Criterion	Result
		0.5		1		2		4			
		+	-	+	-	+	-	+	-		
AC line	L	A	A	B	B					B	**PASS**
	N	A	A	B	B						**PASS**
	PE										
	L+N	A	A	B	B						**PASS**
	L+PE										
	N+PE										
	L+N+PE										
DC Line											
Signal Line											

Note:

1) +/- denotes the Positive/Negative polarity of the output voltage.

2) N/A - denotes test is not applicable in this test report.

3) Criteria A: There was no change operated with initial operating during the test.

4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.

5) Criteria C: The system shut down during the test.

4.7 SURGE TESTING

4.7.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-5
Required Performance	B
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power Line：0.5 kV, 1 kV, 2 kV
Surge Input/Output:	L-N, L-PE, N-PE
Generator Source:	2 ohm between networks
Impedance:	12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	90°/270°
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

4.7.2 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 2meters in length (or shorter).

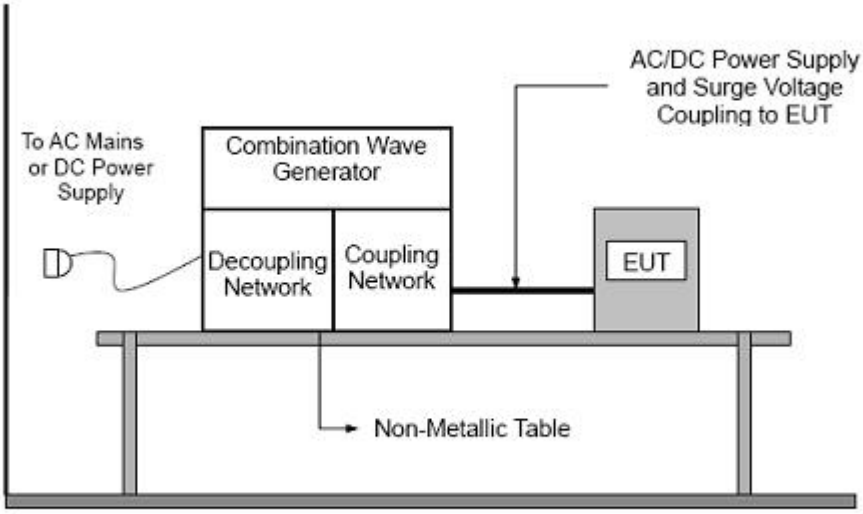
b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

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:

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

4.7.3 TEST SETUP



4.7.4 TEST RESULTS

EUT：	Universal Smart LCD NiMH Charger	Model Name：	VTE-10000
Temperature：	25℃	Relative Humidity：	60%
Pressure：	1010hPa	Test Date：	2014-10-22
Test Mode：	Charging		
Test Power：	AC 230V/50Hz		

Coupling Line			Test level								Criterion	Result
			0.5 kV		1 kV		2 kV		4 kV			
			+	-	+	-	+	-	+	-		
AC line	L-N	0°									B	**PASS**
		90°	A		B							
		180°										
		270°		A		B						
	L-PE	0°										
		90°										
		180°										
		270°										
	N-PE	0°										
		90°										
		180°										
		270°										
DC Line												
Signal Line												

Note:

1) Polarity and Numbers of Impulses：5 Pst / Ngt at each tested mode.
2) N/A - denotes test is not applicable in this Test Report.
3) Criteria A: There was no change operated with initial operating during the test.
4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
5) Criteria C: The system shut down during the test.

4.8 INJECTION CURRENT TESTING

4.8.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-6
Required Performance	A
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3 Vr.m.s.
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	at least 3 seconds

4.8.2 TEST PROCEDURE

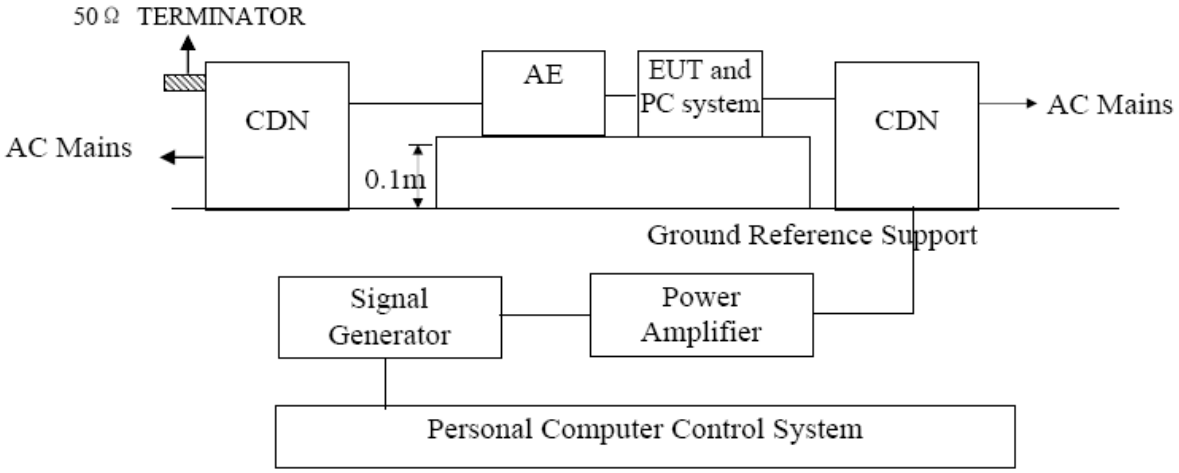
The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50mm (where possible). The disturbance signal described below is injected to EUT through CDN.

The other condition as following manner:

a. The frequency range is swept from 150 KHz to 80 MHz, with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.

b. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

4.8.3 TEST SETUP



NOTE:

FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

4.8.4 TEST RESULTS

EUT：	Universal Smart LCD NiMH Charger	Model Name：	VTE-10000
Temperature：	25℃	Relative Humidity：	60%
Pressure：	1010hPa	Test Date：	2014-10-22
Test Mode：	Charging		
Test Power：	AC 230V/50Hz		

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Perform. Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 ---80	3V(r.m.s.) AM Modulated 1000Hz, 80%	**A**	**A**	**PASS**
Input/ Output DC. Power Port	0.15 --- 80		**A**	**N/A**	**N/A**
Signal Line	0.15 --- 80		**A**	**N/A**	**N/A**

Note:

1) N/A - denotes test is not applicable in this Test Report.
2) Criteria A: There was no change operated with initial operating during the test.
3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
4) Criteria C: The system shut down during the test.

4.9 VOLTAGE INTERRUPTION/DIPS TESTING

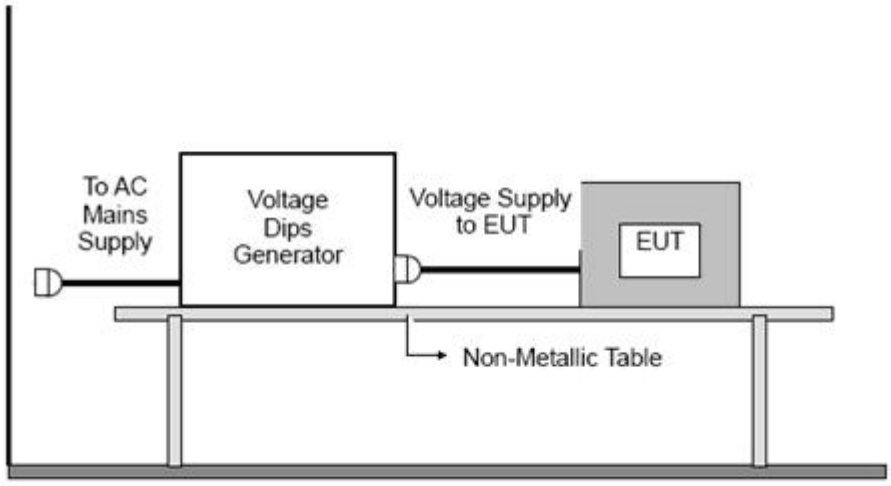
4.9.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-11
Required Performance:	C (For 100% Voltage Dips) C (For 30% Voltage Dips) C (For 60% Voltage Dips)
Test Duration Time:	Minimum three test events in sequence
Interval between Event:	Minimum ten seconds
Phase Angle:	0°/45°/90°/135°/180°/225°/270°/315°/360°
Test Cycle:	3 times

4.9.2 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.

4.9.3 TEST SETUP



4.9.4 TEST RESULTS

EUT：	Universal Smart LCD NiMH Charger	Model Name：	VTE-10000
Temperature：	25℃	Relative Humidity：	60%
Pressure：	1010hPa	Test Date：	2014-10-22
Test Mode：	Charging		
Test Power：	AC 230V/50Hz		

Interruption & Dips	Duration (T)	Perform Criteria	Results	Judgment
Voltage dip 100%	0.5	**C**	**B**	**PASS**
Voltage dip 60%	10	**C**	**B**	**PASS**
Voltage dip 30%	50	**C**	**B**	**PASS**

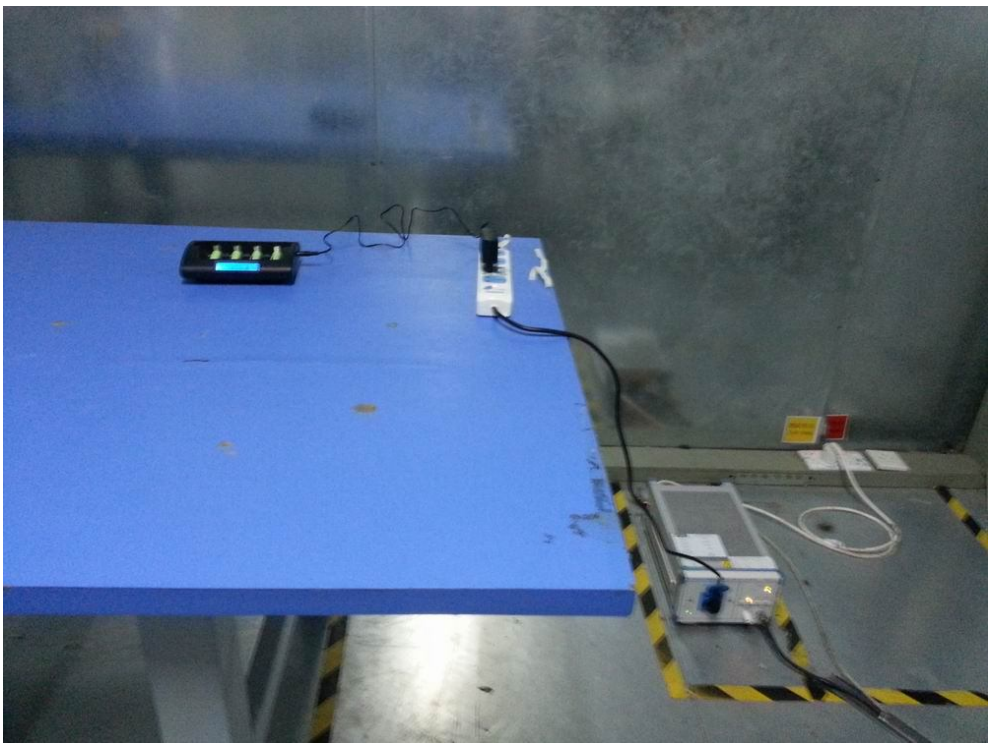
Note:

1). N/A - denotes test is not applicable in this test report.
2) Criteria A: There was no change operated with initial operating during the test.
3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
4) Criteria C: The system shut down during the test.

5. EUT TEST PHOTO

Radiated Measurement Photos

Conducted Measurement Photos



ATTACHMENT PHOTOGRAPHS OF EUT

Photo 1

Photo 2

Photo 3

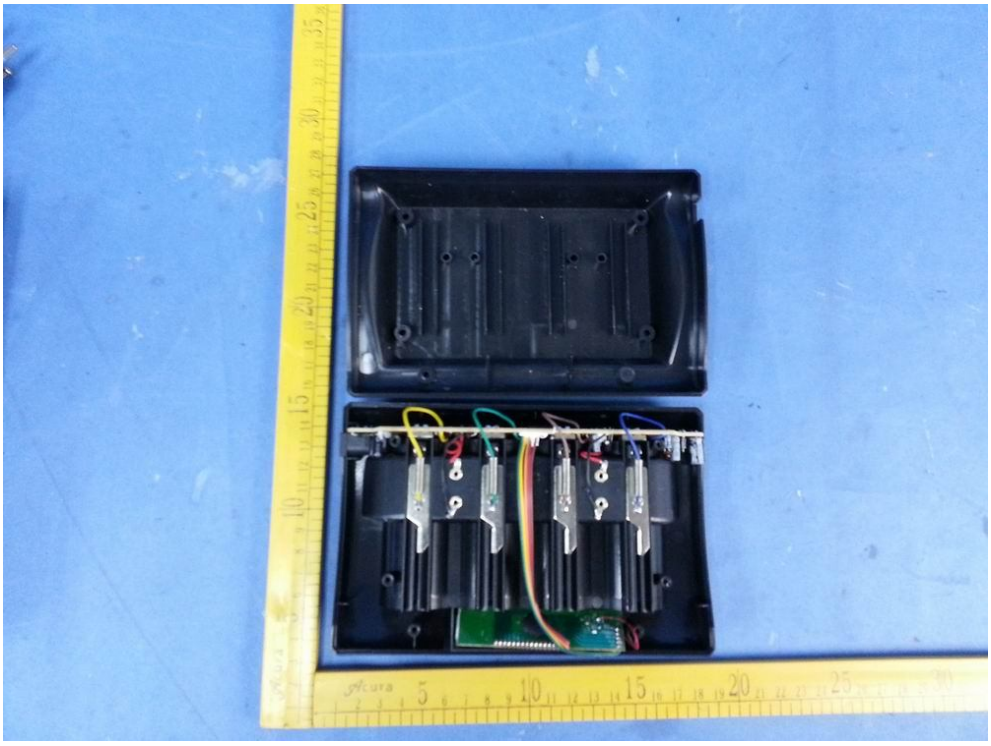


Photo 4

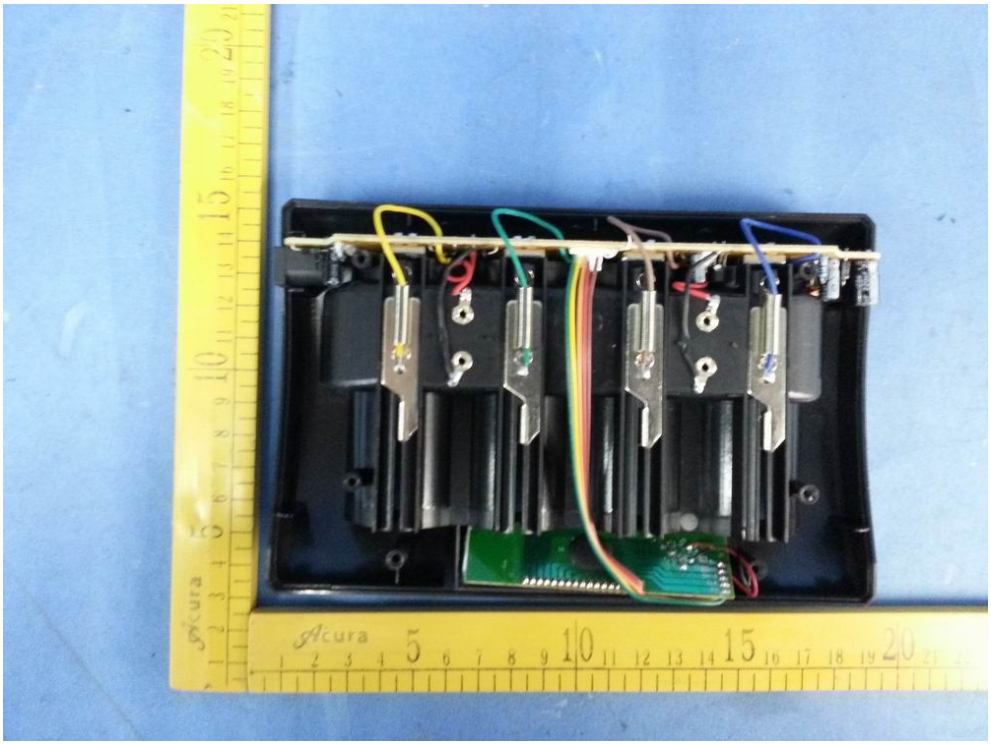


Photo 5

Photo 6

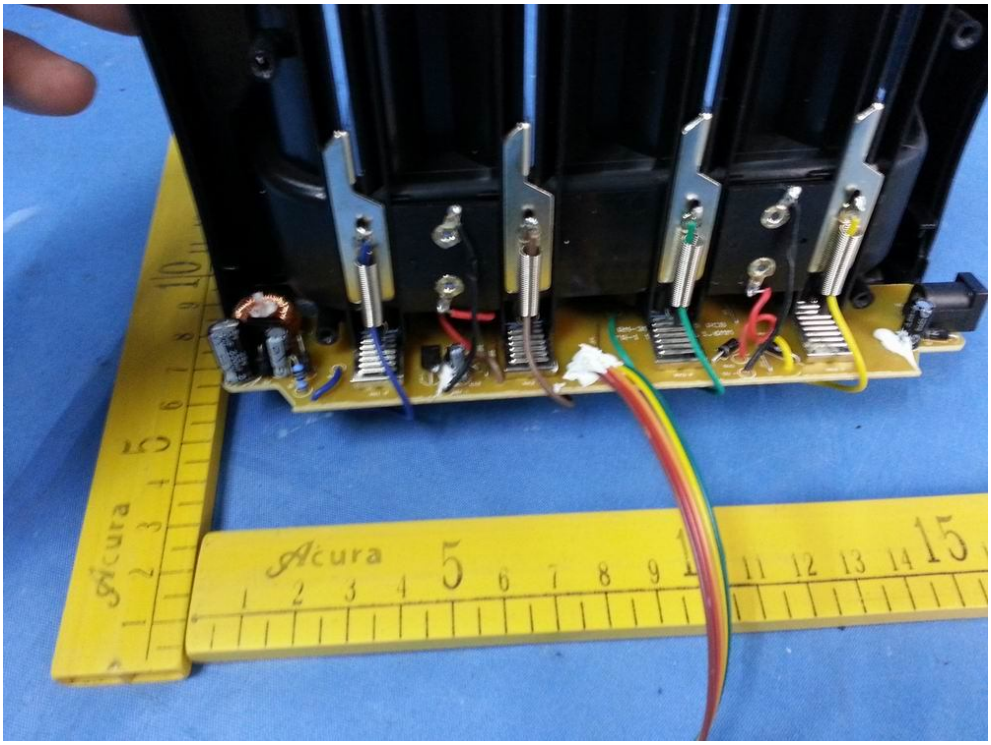


Photo 7