CE EMC Test Report

(Declaration of Conformity)

For

Electromagnetic Interference

Of

Product: Residential Pipe heating cable

Trade Name: E-POLY

Model Number: PFPC1-1A080, PFPC1-1A003, PFPC1-1A006, PFPC1-1A009, PFPC1-1A012, PFPC1-1A015, PFPC1-1A018, PFPC1-1A024, PFPC1-1A030, PFPC1-1A040, PFPC1-1A060

Prepared for

Yangzhou E-poly Technology Co., Ltd.

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Prepared by

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TEST RESULT CERTIFICATION

Applicant's name	:	Yangzhou E-poly Technology Co., Ltd.
Address	:	No.12, Lingbo Road, Economic Development Area, Gaoyou City, Jiangsu Province, China
Manufacturer's Name	:	Yangzhou E-poly Technology Co., Ltd.
Address	:	No.12, Lingbo Road, Economic Development Area, Gaoyou City, Jiangsu Province, China

Product description

Product name	:	Residential Pipe heating cable
Model and/or type reference	:	PFPC1-1A080, PFPC1-1A003, PFPC1-1A006, PFPC1-1A009, PFPC1-1A012, PFPC1-1A015, PFPC1-1A018, PFPC1-1A024, PFPC1-1A030, PFPC1-1A040, PFPC1-1A060
Standards	:	EN 55014-1: 2006+A1:2009+A2: 2011 EN 55014-2: 1997+A1: 2001+A2: 2008 EN 61000-3-2: 2014 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 2014/30/EU 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	:	16 Jun. 2015 ~16 Jul. 2015
Date of Issue	:	16 Jul. 2015
Test Result	:	**Pass**

Testing Engineer : Mary. Hu

(Mary Hu)

Technical Manager : Jane Lv

(Jane Lv)

Authorized Signatory : Sam. Chen

(Sam Chen)

NTEK TESTING TECHNOLOGY CO., LTD. APPROVED

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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	------	PASS	
	Radiated Emission	------	PASS	
EN 61000-3-2:2014	Harmonic Current Emission	Class A 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	Electrostatic Discharge	B	N/A	
EN 61000-4-3	RF electromagnetic field	A	N/A NOTE (3)	
EN 61000-4-4	Fast transients	B	N/A	
EN 61000-4-5	Surges	B	N/A	
EN 61000-4-6	Injected Current	A	N/A	
EN 61000-4-11	Volt. Interruptions Volt. Dips	C / C / C NOTE (4)	N/A	

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) This test is not required when the EUT is judged to be category Ⅰ according to EN55014-2.

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

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

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

(5)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	

C. Disturbance Power Measurement :

Test Site	Method	Measurement Frequency Range	U，(dB)	NOTE
NTEKC01	ANSI	30 kHz ~ 300MHz	3.5	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Residential Pipe heating cable
Model Name	PFPC1-1A080
Additional Model Number(s)	PFPC1-1A003, PFPC1-1A006, PFPC1-1A009, PFPC1-1A012, PFPC1-1A015, PFPC1-1A018, PFPC1-1A024, PFPC1-1A030, PFPC1-1A040, PFPC1-1A060
Model Difference	All models are identical except model name.
Product Description	The EUT is a Residential Pipe heating cable. 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	AC Voltage
Power Rating	AC 230V, 50Hz, 560W

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.

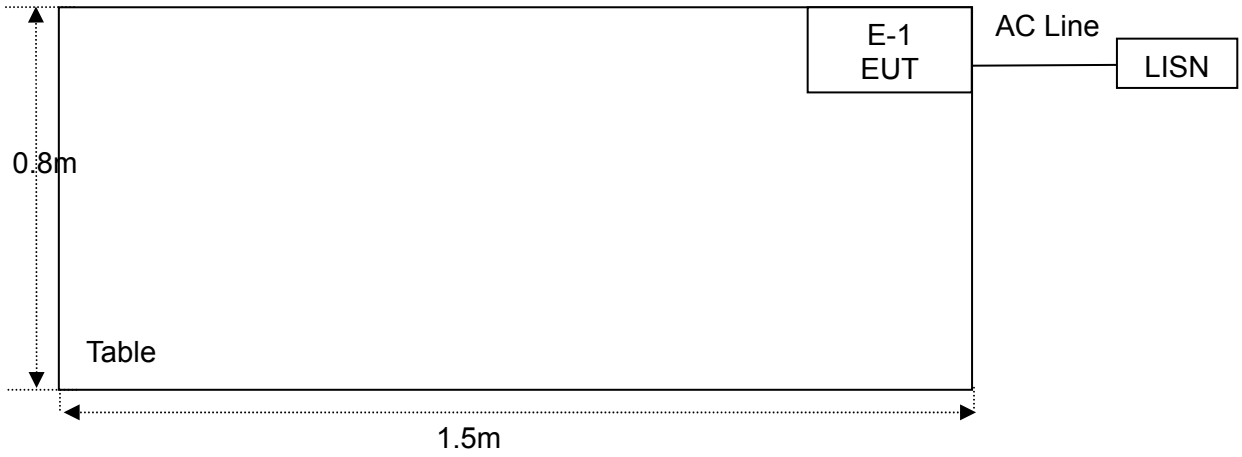
Pretest Mode	Description
Mode 1	Running

For Conducted Test	
Final Test Mode	Description
Mode 1	Running

For Radiated Test	
Final Test Mode	Description
Mode 1	Running

2.3 DESCRIPTION OF TEST SETUP

Mode CE: Running



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	Residential Pipe heating cable	E-POLY	PFPC1-1A080	N/A	EUT

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, 2015	Jul. 06, 2016	1 year
2	50Ω Switch	ANRITSU CORP	MP59B	6200983704	Jun. 16, 2015	Jun. 15, 2016	1 year
3	Low frequency cable	N/A	C-2	C-2	Dec. 02, 2014	Dec. 01, 2015	1 year
4	EMI Test Receiver	R&S	ESCI	101160	Jun. 16, 2015	Jun. 15, 2016	1 year

2.5.2 RADIATED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Cable	N/A	C02	N/A	Jun. 16, 2015	Jun. 15, 2016	1 year
2	EMI Test Receiver	R&S	ESCI	101160	Jun. 16, 2015	Jun. 15, 2016	1 year
3	Absorbing Clamp	R&S	MDS-21	100423	Jun. 16, 2015	Jun. 15, 2016	1 year
4	50Ω Switch	ANRITSU CORP	MP59B	6200983704	Jun. 16, 2015	Jun. 15, 2016	1 year

2.5.3 HARMONICS AND FLICKERS

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, 2015	Jun. 17, 2016	1 year
2	AC Power Source	EM TEST	ACS500	0203-01	Jun. 18, 2015	Jun. 17, 2016	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 (dBμV)	Average (dBμV)	Quasi-peak (dBμV)	Average (dBμV)
0.15 -0.5	66 - 56 *	59 - 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

Note:

(1) Based on our laboratory conditions, the test of load terminals is not performed.

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)	(dBμV) Quasi-peak	(dBμV) Average**	(dBμV) Quasi-peak	(dBμV) Average**	(dBμV) Quasi-peak	(dBμV) 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.

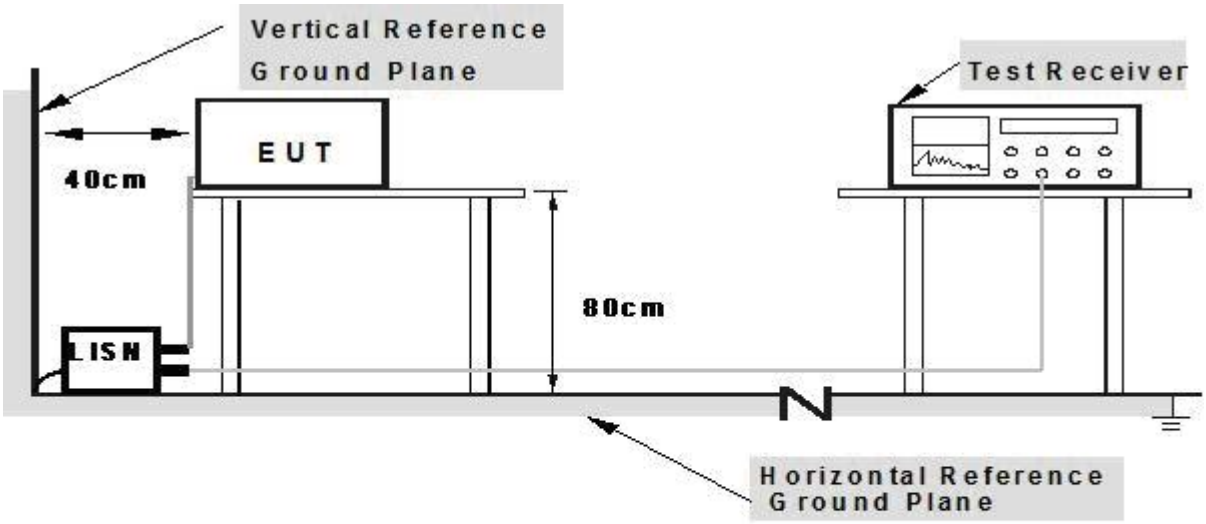
The following table is the setting of the receiver

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

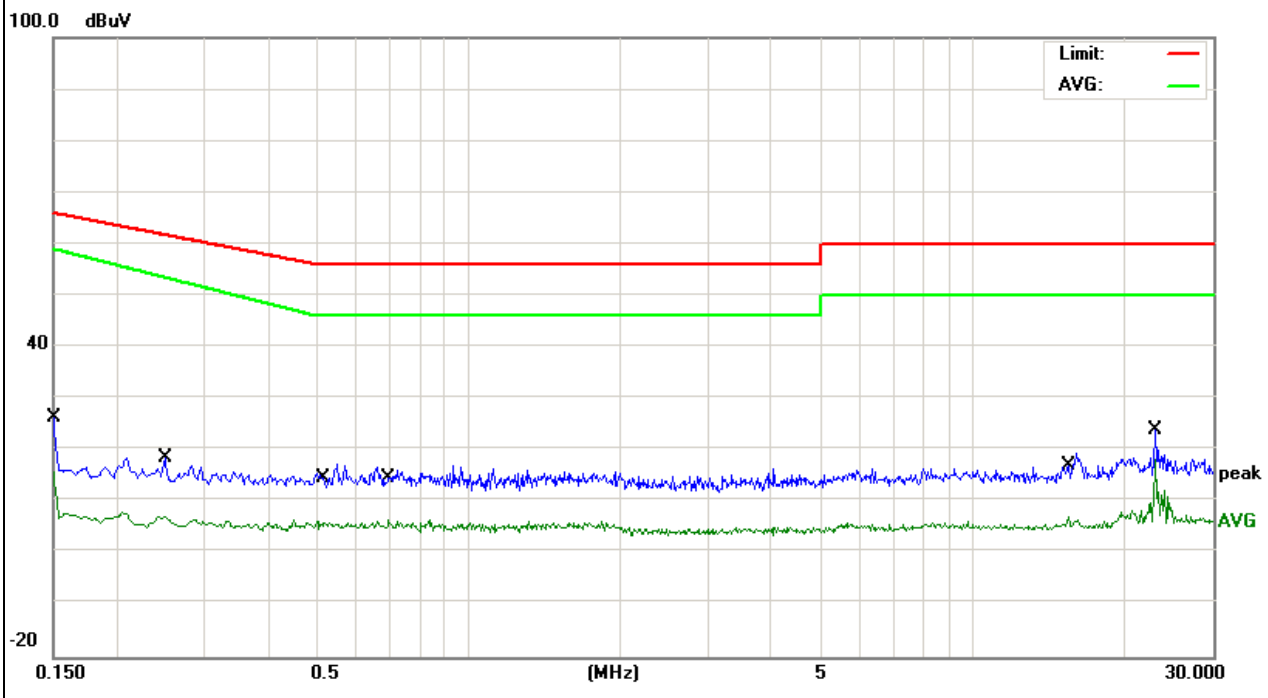
The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.1.6 TEST RESULTS

EUT:	Residential Pipe heating cable	Model Name:	PFPC1-1A080
Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2015-07-13
Test Mode:	Running	Phase:	L
Test Voltage:	AC 230V/50Hz		

Freq. (MHz)	Reading (dBμV)	Factor (dB)	Measurement (dBμV)	Limit (dBμV)	Over (dB)	Detector
0.1500	16.84	9.63	26.47	65.99	-39.52	QP
0.1500	6.28	9.63	15.91	58.99	-43.08	AVG
0.2500	9.00	9.67	18.67	61.75	-43.08	QP
0.2500	-2.46	9.67	7.21	53.48	-46.27	AVG
0.5181	7.52	9.77	17.29	56.00	-38.71	QP
0.5181	-3.91	9.77	5.86	46.00	-40.14	AVG
0.6939	6.94	9.78	16.72	56.00	-39.28	QP
0.6939	-3.09	9.78	6.69	46.00	-39.31	AVG
15.5458	9.58	9.82	19.40	60.00	-40.60	QP
15.5458	-2.57	9.82	7.25	50.00	-42.75	AVG
23.1299	13.92	9.94	23.86	60.00	-36.14	QP
23.1299	8.17	9.94	18.11	50.00	-31.89	AVG

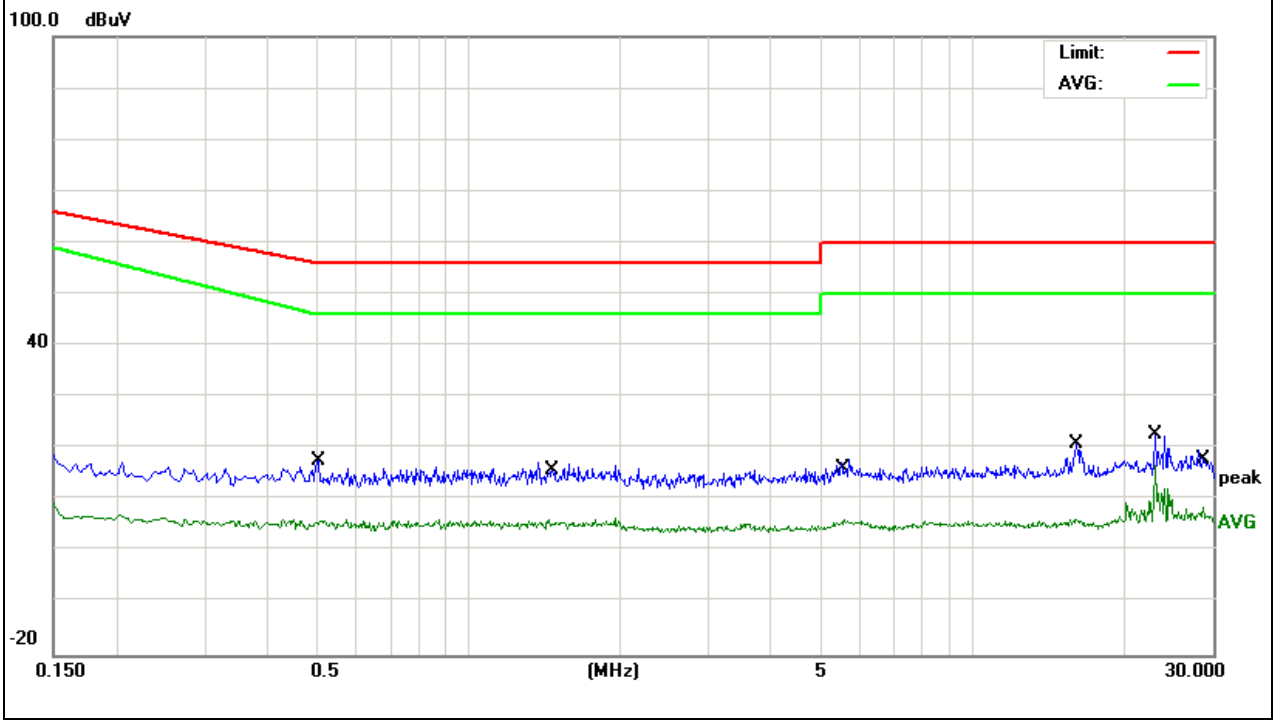
Remark:
Factor = Insertion Loss + Cable Loss.



EUT:	Residential Pipe heating cable	Model Name. :	PFPC1-1A080
Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date :	2015-07-13
Test Mode:	Running	Phase :	N
Test Voltage :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBμV)	Factor (dB)	Measurement (dBμV)	Limit (dBμV)	Over (dB)	Detector
0.5100	8.04	9.68	17.72	56.00	-38.28	QP
0.5100	-3.69	9.68	5.99	46.00	-40.01	AVG
1.4419	7.87	9.58	17.45	56.00	-38.55	QP
1.4419	-3.36	9.58	6.22	46.00	-39.78	AVG
5.5698	8.57	9.51	18.08	60.00	-41.92	QP
5.5698	-3.31	9.51	6.20	50.00	-43.80	AVG
16.0219	11.27	9.77	21.04	60.00	-38.96	QP
16.0219	-3.42	9.77	6.35	50.00	-43.65	AVG
23.1299	12.90	9.91	22.81	60.00	-37.19	QP
23.1299	6.80	9.91	16.71	50.00	-33.29	AVG
28.6739	9.61	10.00	19.61	60.00	-40.39	QP
28.6739	-1.39	10.00	8.61	50.00	-41.39	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
	dBμV/m	dBμV/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 (dBμV/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.

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.

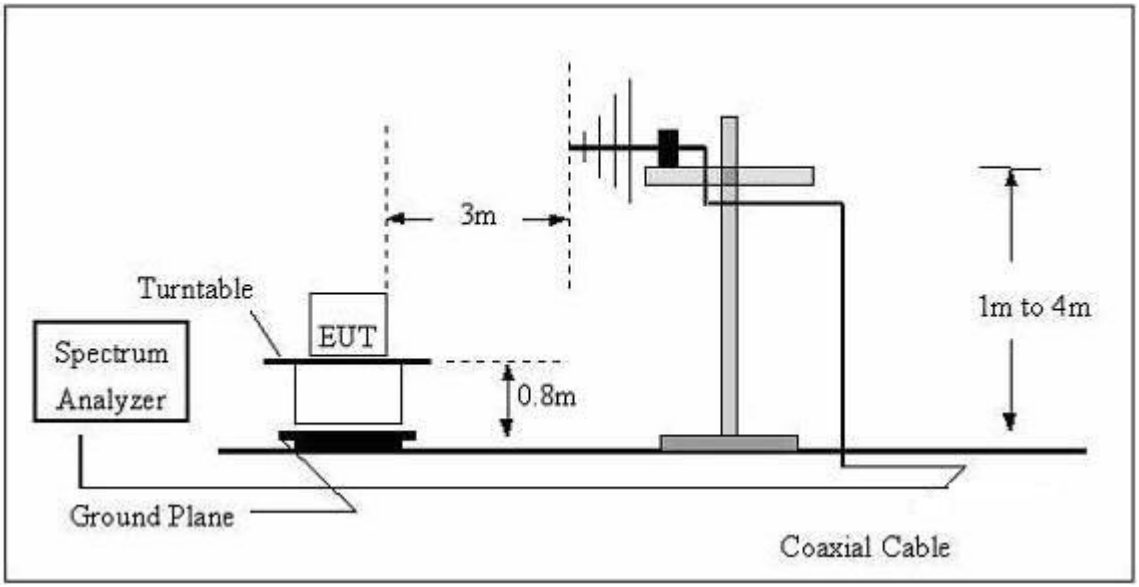
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.

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.



3.2.5 EUT OPERATING CONDITIONS

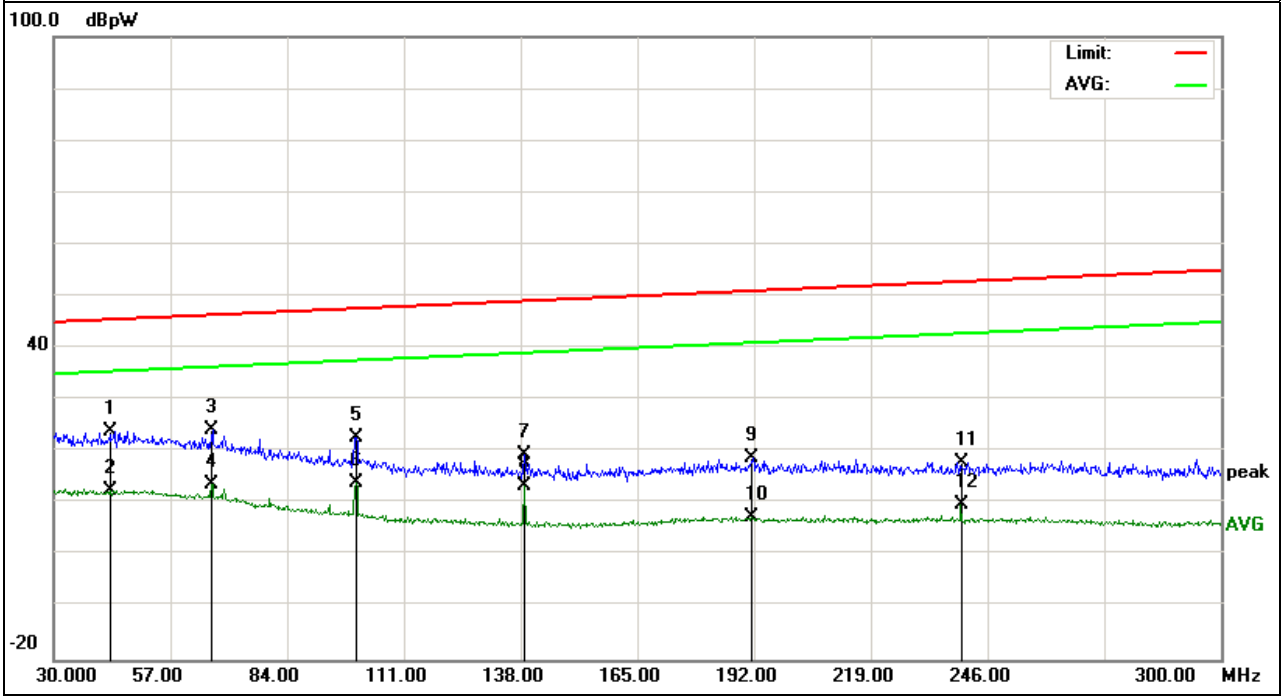
The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (30MHz ~300MHz)

EUT:	Residential Pipe heating cable	Model Name:	PFPC1-1A080
Temperature:	24℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date :	2015-07-13
Test Mode:	Running	Test Port:	AC Line
Test Power:	AC 230V/50Hz		

Freq. (MHz)	Reading (dBpW)	Factor (dB)	Measurement (dBpW)	Limit (dBpW)	Over (dB)	Detector
43.0399	2.72	21.30	24.02	45.48	-21.46	QP
43.0399	-8.65	21.30	12.65	35.48	-22.83	AVG
66.5599	4.04	20.11	24.15	46.35	-22.20	QP
66.5599	-6.38	20.11	13.73	36.35	-22.62	AVG
100.0400	5.43	17.40	22.83	47.59	-24.76	QP
100.0400	-3.31	17.40	14.09	37.59	-23.50	AVG
138.9600	3.76	15.65	19.41	49.04	-29.63	QP
138.9600	-2.06	15.65	13.59	39.04	-25.45	AVG
191.4798	2.64	16.20	18.84	50.98	-32.14	QP
191.4798	-8.87	16.20	7.33	40.98	-33.65	AVG
239.9999	1.77	16.20	17.97	52.78	-34.81	QP
239.9999	-6.45	16.20	9.75	42.78	-33.03	AVG

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



3.3 HARMONICS CURRENT

3.3.1 LIMITS OF HARMONICS CURRENT(CLASS A)

Table 1 – Limits for Class A equipment

Harmonic order (n)	Maximum permissible harmonic current (A)
Odd harmonics	
3	2.3
5	1.14
7	0.77
9	0.4
11	0.33
13	0.21
15≤n≤39	0.15*(15/n)
Even harmonics	
2	1.08
4	0.43
6	0.30
8≤n≤40	0.23*(8/n)

Note: Reference standard of the table above: EN61000-3-2.

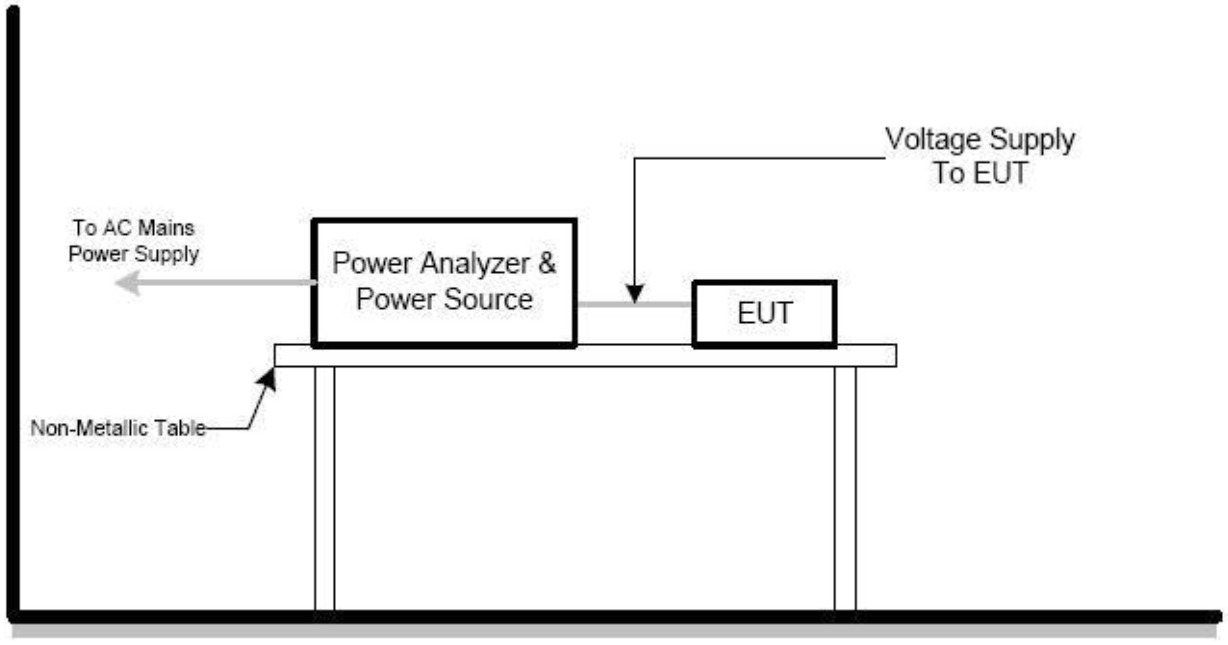
3.3.1.1TEST PROCEDURE

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:	Residential Pipe heating cable	Model Name:	PFPC1-1A080
Temperature:	25℃	Relative Humidity:	45%
Pressure:	1010hPa	Test Date :	2015-07-13
Test Mode:	Running	Test duration:	150s
Test Power:	AC 230V/50Hz		

E. U. T. Result

Harmonic(s) > 200%:	
Order (n):	None
Harmonic(s) with average > 90%:	
Order (n):	None
Harmonic(s) between 150% and 200% during more than 10% of the test time or max. 10min:	
Order (n):	None

Power Source Result

First dataset out of limit:	
DS (time):	None
Harmonic(s) out of limit:	
Order (n):	None

Average harmonic current results

Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
1	2.487	100.000		
2	1.593E-3	0.064	972.00E-3	PASS
3	123.859E-3	4.980	2.07	PASS
4	1.898E-3	0.076	387.00E-3	PASS
5	75.917E-3	3.052	1.03	PASS
6	875.125E-6	0.035	270.00E-3	PASS
7	54.662E-3	2.198	693.00E-3	PASS
8	857.026E-6	0.034	207.00E-3	PASS
9	31.496E-3	1.266	360.00E-3	PASS
10	790.333E-6	0.032	165.60E-3	PASS
11	25.983E-3	1.045	297.00E-3	PASS
12	825.587E-6	0.033	138.00E-3	PASS
13	28.280E-3	1.137	189.00E-3	PASS
14	803.809E-6	0.032	118.29E-3	PASS
15	21.601E-3	0.868	135.00E-3	PASS
16	822.933E-6	0.033	103.50E-3	PASS
17	17.179E-3	0.691	119.11E-3	PASS
18	1.131E-3	0.045	92.00E-3	PASS
19	18.803E-3	0.756	106.58E-3	PASS
20	810.767E-6	0.033	82.80E-3	PASS
21	16.695E-3	0.671	96.43E-3	PASS
22	1.082E-3	0.044	75.28E-3	PASS
23	15.228E-3	0.612	88.05E-3	PASS
24	865.797E-6	0.035	68.99E-3	PASS
25	16.437E-3	0.661	81.00E-3	PASS
26	910.422E-6	0.037	63.69E-3	PASS
27	14.687E-3	0.590	75.00E-3	PASS
28	886.615E-6	0.036	59.14E-3	PASS
29	14.086E-3	0.566	69.83E-3	PASS
30	919.135E-6	0.037	55.20E-3	PASS
31	17.316E-3	0.696	65.32E-3	PASS
32	942.990E-6	0.038	51.75E-3	PASS
33	16.486E-3	0.663	61.36E-3	PASS
34	967.333E-6	0.039	48.71E-3	PASS
35	14.035E-3	0.564	57.86E-3	PASS
36	1.094E-3	0.044	46.00E-3	PASS
37	15.910E-3	0.640	54.73E-3	PASS
38	1.021E-3	0.041	43.58E-3	PASS
39	16.071E-3	0.646	51.92E-3	PASS
40	1.195E-3	0.048	41.40E-3	PASS

Maximum harmonic current results

Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
1	2.488	100.000		
2	1.822E-3	0.073	2.16	PASS
3	124.524E-3	5.005	4.60	PASS
4	2.049E-3	0.082	860.00E-3	PASS
5	76.286E-3	3.066	2.28	PASS
6	1.023E-3	0.041	600.00E-3	PASS
7	55.253E-3	2.221	1.54	PASS
8	983.951E-6	0.040	460.00E-3	PASS
9	31.799E-3	1.278	800.00E-3	PASS
10	894.621E-6	0.036	368.00E-3	PASS
11	26.342E-3	1.059	660.00E-3	PASS
12	943.837E-6	0.038	306.66E-3	PASS
13	28.577E-3	1.149	420.00E-3	PASS
14	916.061E-6	0.037	262.86E-3	PASS
15	21.965E-3	0.883	300.00E-3	PASS
16	948.680E-6	0.038	230.00E-3	PASS
17	17.509E-3	0.704	264.70E-3	PASS
18	1.247E-3	0.050	204.44E-3	PASS
19	19.063E-3	0.766	236.84E-3	PASS
20	942.561E-6	0.038	184.00E-3	PASS
21	16.958E-3	0.682	214.28E-3	PASS
22	1.209E-3	0.049	167.28E-3	PASS
23	15.632E-3	0.628	195.66E-3	PASS
24	1.047E-3	0.042	153.32E-3	PASS
25	16.691E-3	0.671	180.00E-3	PASS
26	1.080E-3	0.043	141.54E-3	PASS
27	15.087E-3	0.606	166.66E-3	PASS
28	1.045E-3	0.042	131.42E-3	PASS
29	14.410E-3	0.579	155.18E-3	PASS
30	1.096E-3	0.044	122.66E-3	PASS
31	17.699E-3	0.711	145.16E-3	PASS
32	1.106E-3	0.044	115.00E-3	PASS
33	16.851E-3	0.677	136.36E-3	PASS
34	1.123E-3	0.045	108.24E-3	PASS
35	14.358E-3	0.577	128.58E-3	PASS
36	1.284E-3	0.052	102.22E-3	PASS
37	16.279E-3	0.654	121.62E-3	PASS
38	1.200E-3	0.048	96.84E-3	PASS
39	16.506E-3	0.663	115.38E-3	PASS
40	1.428E-3	0.057	92.00E-3	PASS

Maximum harmonic voltage results

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	231.46	100.619		
2	38.65E-3	0.017	0.2	PASS
3	38.01E-3	0.017	0.9	PASS
4	14.68E-3	0.006	0.2	PASS
5	66.00E-3	0.029	0.4	PASS
6	11.27E-3	0.005	0.2	PASS
7	58.71E-3	0.026	0.3	PASS
8	12.39E-3	0.005	0.2	PASS
9	27.90E-3	0.012	0.2	PASS
10	13.33E-3	0.006	0.2	PASS
11	30.42E-3	0.013	0.1	PASS
12	11.22E-3	0.005	0.1	PASS
13	26.09E-3	0.011	0.1	PASS
14	9.62E-3	0.004	0.1	PASS
15	36.56E-3	0.016	0.1	PASS
16	10.87E-3	0.005	0.1	PASS
17	45.39E-3	0.020	0.1	PASS
18	10.15E-3	0.004	0.1	PASS
19	30.95E-3	0.013	0.1	PASS
20	10.91E-3	0.005	0.1	PASS
21	35.66E-3	0.015	0.1	PASS
22	8.16E-3	0.004	0.1	PASS
23	60.74E-3	0.026	0.1	PASS
24	11.11E-3	0.005	0.1	PASS
25	53.33E-3	0.023	0.1	PASS
26	7.96E-3	0.003	0.1	PASS
27	25.61E-3	0.011	0.1	PASS
28	9.64E-3	0.004	0.1	PASS
29	49.82E-3	0.022	0.1	PASS
30	9.16E-3	0.004	0.1	PASS
31	68.17E-3	0.030	0.1	PASS
32	9.41E-3	0.004	0.1	PASS
33	46.95E-3	0.020	0.1	PASS
34	9.88E-3	0.004	0.1	PASS
35	32.50E-3	0.014	0.1	PASS
36	10.38E-3	0.005	0.1	PASS
37	53.67E-3	0.023	0.1	PASS
38	8.28E-3	0.004	0.1	PASS
39	54.75E-3	0.024	0.1	PASS
40	9.10E-3	0.004	0.1	PASS

Harmonic current results - DS: 55

Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
1	2.487	100.000		
2	1.455E-3	0.059	1.08	PASS
3	124.367E-3	5.001	2.30	PASS
4	1.805E-3	0.073	430.00E-3	PASS
5	75.872E-3	3.051	1.14	PASS
6	912.991E-6	0.037	300.00E-3	PASS
7	55.006E-3	2.212	770.00E-3	PASS
8	791.366E-6	0.032	230.00E-3	PASS
9	31.724E-3	1.276	400.00E-3	PASS
10	796.830E-6	0.032	184.00E-3	PASS
11	26.249E-3	1.056	330.00E-3	PASS
12	874.660E-6	0.035	153.33E-3	PASS
13	28.430E-3	1.143	210.00E-3	PASS
14	807.239E-6	0.032	131.43E-3	PASS
15	21.809E-3	0.877	150.00E-3	PASS
16	899.881E-6	0.036	115.00E-3	PASS
17	17.347E-3	0.698	132.35E-3	PASS
18	1.149E-3	0.046	102.22E-3	PASS
19	18.830E-3	0.757	118.42E-3	PASS
20	826.522E-6	0.033	92.00E-3	PASS
21	16.697E-3	0.671	107.14E-3	PASS
22	1.185E-3	0.048	83.64E-3	PASS
23	15.481E-3	0.623	97.83E-3	PASS
24	938.184E-6	0.038	76.66E-3	PASS
25	16.465E-3	0.662	90.00E-3	PASS
26	954.324E-6	0.038	70.77E-3	PASS
27	14.695E-3	0.591	83.33E-3	PASS
28	881.912E-6	0.035	65.71E-3	PASS
29	14.297E-3	0.575	77.59E-3	PASS
30	973.561E-6	0.039	61.33E-3	PASS
31	17.424E-3	0.701	72.58E-3	PASS
32	881.580E-6	0.035	57.50E-3	PASS
33	16.504E-3	0.664	68.18E-3	PASS
34	994.937E-6	0.040	54.12E-3	PASS
35	14.192E-3	0.571	64.29E-3	PASS
36	1.117E-3	0.045	51.11E-3	PASS
37	16.043E-3	0.645	60.81E-3	PASS
38	1.035E-3	0.042	48.42E-3	PASS
39	16.149E-3	0.649	57.69E-3	PASS
40	1.266E-3	0.051	46.00E-3	PASS

Caution: Results related to the 100% limit values

Harmonic voltage results - DS: 55

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	231.44	100.609		
2	19.86E-3	0.009	0.2	PASS
3	31.20E-3	0.014	0.9	PASS
4	4.78E-3	0.002	0.2	PASS
5	56.50E-3	0.025	0.4	PASS
6	7.54E-3	0.003	0.2	PASS
7	35.00E-3	0.015	0.3	PASS
8	3.94E-3	0.002	0.2	PASS
9	9.17E-3	0.004	0.2	PASS
10	8.27E-3	0.004	0.2	PASS
11	14.35E-3	0.006	0.1	PASS
12	4.62E-3	0.002	0.1	PASS
13	20.77E-3	0.009	0.1	PASS
14	3.22E-3	0.001	0.1	PASS
15	32.19E-3	0.014	0.1	PASS
16	7.98E-3	0.003	0.1	PASS
17	29.49E-3	0.013	0.1	PASS
18	7.49E-3	0.003	0.1	PASS
19	22.18E-3	0.010	0.1	PASS
20	3.98E-3	0.002	0.1	PASS
21	19.28E-3	0.008	0.1	PASS
22	5.69E-3	0.002	0.1	PASS
23	52.27E-3	0.023	0.1	PASS
24	7.44E-3	0.003	0.1	PASS
25	42.43E-3	0.018	0.1	PASS
26	7.49E-3	0.003	0.1	PASS
27	16.29E-3	0.007	0.1	PASS
28	6.82E-3	0.003	0.1	PASS
29	39.50E-3	0.017	0.1	PASS
30	582.86E-6	0.000	0.1	PASS
31	58.33E-3	0.025	0.1	PASS
32	6.06E-3	0.003	0.1	PASS
33	42.17E-3	0.018	0.1	PASS
34	3.46E-3	0.002	0.1	PASS
35	20.87E-3	0.009	0.1	PASS
36	4.92E-3	0.002	0.1	PASS
37	49.45E-3	0.021	0.1	PASS
38	5.44E-3	0.002	0.1	PASS
39	37.31E-3	0.016	0.1	PASS
40	6.60E-3	0.003	0.1	PASS

Power and THD results - DS: 55

True power P:	568W	Apparent power S:	577VA
Reactiv power Q:	101.2var	Power factor:	0.984
THD (U):	0.001	THD (I):	0.071
Crest Factor (U):	1.414	Crest Factor (I):	1.395

3.4 VOLTAGE FLUCTUATION AND FLICKERS

3.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKERS

Test items	Limits(EN61000-3-3)	Descriptions
P_{st}	≤1.0, T_p=10min	short-term flicker indicator
P_{lt}	≤0.65, T_p=2h	long-term flicker indicator
d_c	≤3.3%	relative steady-state voltage change
d_{max}	≤4%(or 6%Note(1), 7% Note(2))	maximum relative voltage change:
$d_{(t)}$	≤3.3%, more than 500ms	relative voltage change characteristic

Note:

1. 6 % for equipment which is:
   a. switched manually, or
   b. switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.
2. 7 % for equipment which is
   a. attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
   b. switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

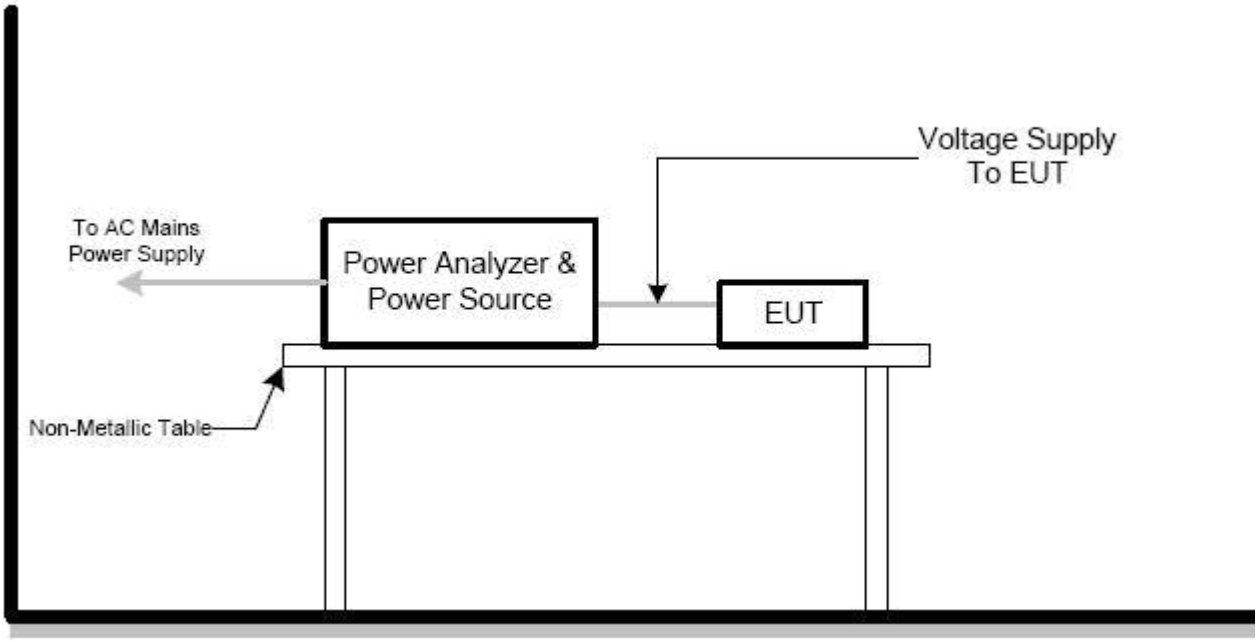
3.4.1.1TEST PROCEDURE

a. Harmonic Current Test:
Test was performed according to the procedures specified in 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 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


Voltage Supply
To EUT
To AC Mains
Power Supply
Power Analyzer &
Power Source
EUT
Non-Metallic Table

3.4.2 TEST RESULTS

EUT:	Residential Pipe heating cable	Model Name:	PFPC1-1A080
Temperature:	25℃	Relative Humidity:	45%
Pressure:	1010hPa	Test Date:	2015-07-13
Test Mode:	Running		
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 [%]	0.016	3.30	PASS
dmax [%]	0.254	4.00	PASS
dt [s]	0.000	0.50	PASS

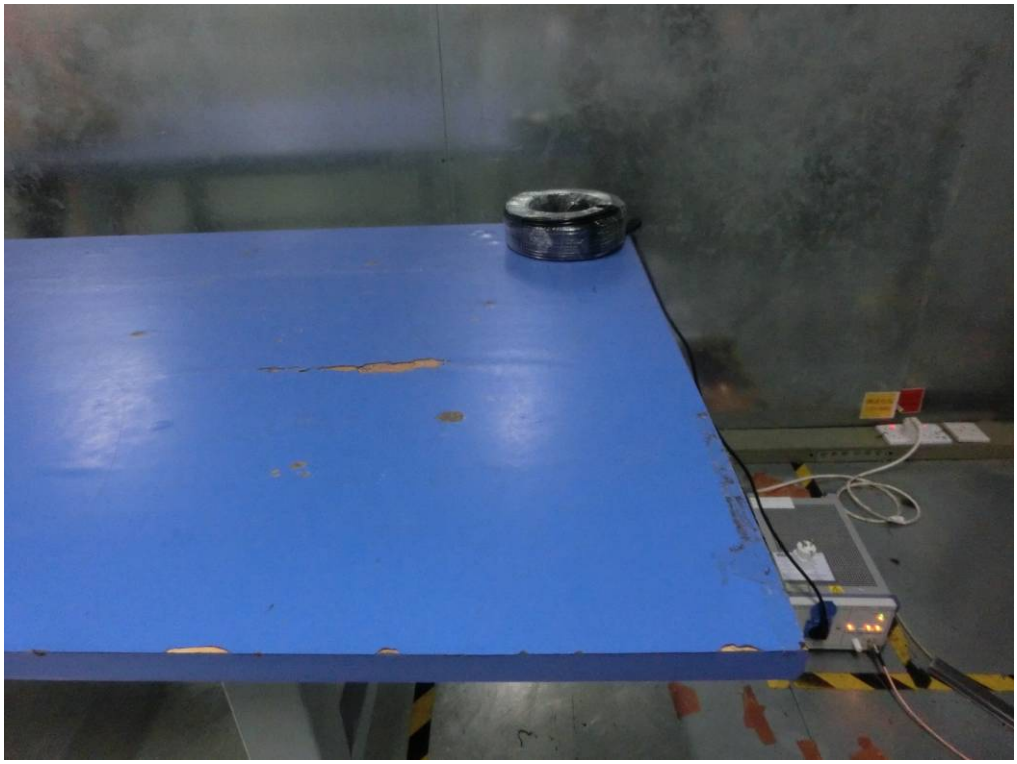
4. EMC IMMUNITY TEST

This Sample is no electronic circuit, According to the standard EN 55014-2 without EMS test.

5. EUT TEST PHOTO

Radiated Measurement Photos

Conducted Measurement Photos



ATTACHMENT PHOTOGRAPHS OF EUT

Photo 1

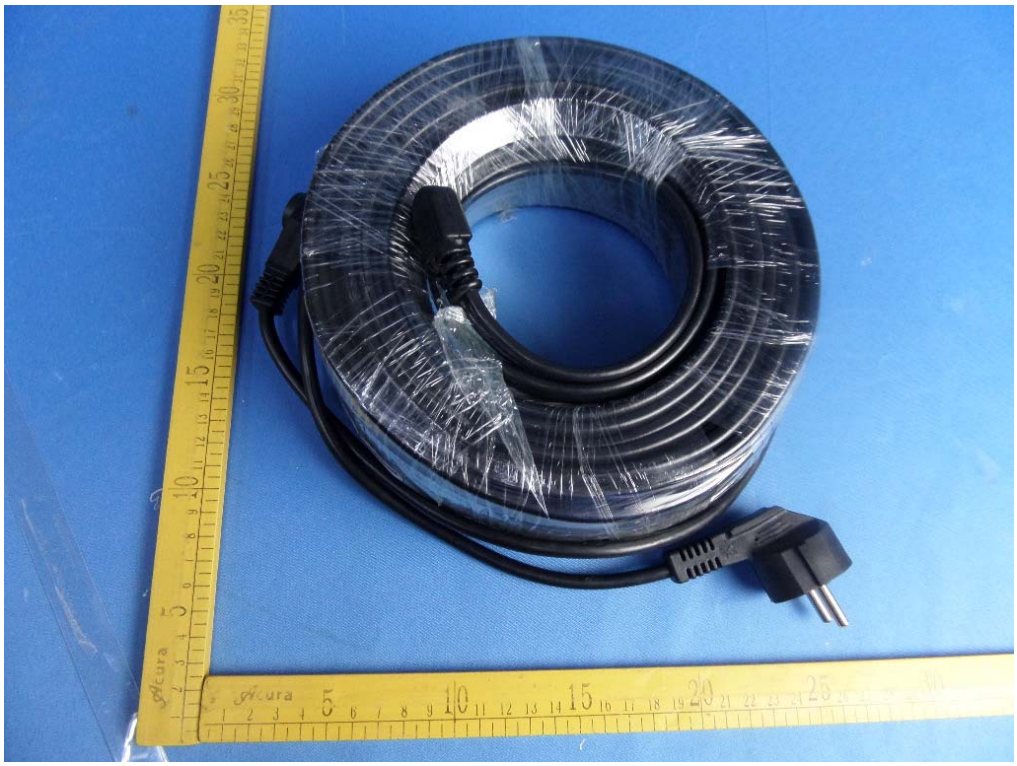


Photo 2