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
MEASUREMENT AND TEST REPORT

For

SHENZHEN ZHONGKE CENTURY TECHNOLOGY CO., LTD

2th floor, NO.4 Building, Fu'an third Industrail area, Fuyong, Bao'an, Shenzhen

Model: DC50Q, DC50Q-5000L, DC50Q-4000L, DC50Q-3000L, DC60Q, DC60Q-10000L, DC60Q-8000L, DC60Q-6000L, DC50W, DC50W-80, DC50W-60, DC50W-40, DC50W-25, DC40W, DC40W-10, DC40W-25

Sep 03, 2014

This Report Concerns: ☒ Original Report	**Equipment Type:** DC pump
Report Number:	MTI140828001RE
Test Engineer:	David Chen
Reviewed By:	Bill Chen
Approved & Authorized By:	Tim Zhang
Test Date:	Aug 28, 2014 – Sep 03, 2014
Prepared By:	**Shenzhen Microtest Technology Co.,Ltd** 6F, Zhongbao Building, Gushu, Bao'an District, Shenzhen, P.R.China Tel: +86-755-8885 0135 Fax: +86-755-8885 0136

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Shenzhen Microtest Technology Co.,Ltd.

.

TABLE OF CONTENTS

1. GENERAL INFORMATION 4

1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 4
1.2 TEST STANDARDS 4
1.3 TEST SUMMARY 5
1.4 TEST METHODOLOGY 5
1.5 TEST FACILITY 6
1.6 TEST EQUIPMENT LIST AND DETAILS 6

2. SYSTEM TEST CONFIGURATION 8

2.1 JUSTIFICATION 8
2.2 EUT EXERCISE SOFTWARE 8
2.3 SPECIAL ACCESSORIES 8
2.4 EQUIPMENT MODIFICATIONS 8
2.5 CONFIGURATION OF TEST SYSTEM 8
2.6 TEST SETUP DIAGRAM 8

3. RADIATED DISTURBANCES 9

3.1 MEASUREMENT UNCERTAINTY 9
3.2 LIMIT OF RADIATED DISTURBANCES 9
3.3 EUT SETUP 9
3.4 TEST RECEIVER SETUP 9
3.5 TEST PROCEDURE 10
3.6 CORRECTED AMPLITUDE & MARGIN CALCULATION 10
3.7 RADIATED EMISSIONS TEST RESULT 10
3.8 TEST RESULT 10

4. DISTURBANCE POWER EMISSION 13

4.1 MEASUREMENT UNCERTAINTY 13
4.2 LIMIT OF RADIATED DISTURBANCES (CLASS B) 13
4.3 EUT SETUP 13
4.4 TEST RECEIVER SETUP 13
4.5 TEST PROCEDURE 14
4.6 CORRECTED AMPLITUDE & MARGIN CALCULATION 14
4.7 DISTURBANCE POWER EMISSION TEST RESULT 14
4.8 TEST RESULT 14

5. CONDUCTED DISTURBANCES 16

5.1. MEASUREMENT UNCERTAINTY 16
5.2. LIMIT OF CONDUCTED DISTURBANCES (CLASS B) 16
5.3. EUT SETUP 16
5.4. INSTRUMENT SETUP 16
5.5. TEST PROCEDURE 17
5.6. SUMMARY OF TEST RESULTS 17
5.7. TEST RESULT 17

6. HARMONIC CURRENT TEST 20

6.1 APPLICATION OF HARMONIC CURRENT EMISSION 20
6.2 MEASUREMENT DATA 20
6.3 TEST RESULTS 20

7. VOLTAGE FLUCTUATIONS AND FLICKER TEST 22

7.1 APPLICATION OF VOLTAGE FLUCTUATIONS AND FLICKER TEST 22
7.2 MEASUREMENT DATA 22
7.3 TEST RESULTS 22

8. IMMUNITY MEASUREMENT INSTRUMENTATION.....23
8.1 ELECTROSTATIC DISCHARGE TEST SYSTEM..... 23
8.2 RADIATED SUSCEPTIBILITY TEST SYSTEM.....23
8.3 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST SYSTEM..... 23
8.4 VOLTAGE DIPS, SHORT INTERRUPTIONS IMMUNITY TESTS SYSTEM.....23
8.5 SURGE IMMUNITY TEST SYSTEM..... 23
8.6 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST SYSTEM.....23
8.7 CONDUCTED SUSCEPTIBILITY TEST SYSTEM.....23
8.8 EQUIPMENT TEST TABLE.....24
8.9 INSTRUMENT CALIBRATION..... 24
9. IMMUNITY TEST PROCEDURES..... 25
9.1 EUT AND CABLE PLACEMENT..... 25
9.2 APPLICATION OF ELECTROSTATIC DISCHARGE IMMUNITY TEST.....25
9.3 APPLICATION OF RADIATED SUSCEPTIBILITY TEST..... 25
9.4 APPLICATION OF POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST.....25
9.5 APPLICATION OF VOLTAGE DIPS, SHORT INTERRUPTIONS IMMUNITY TESTS..... 25
9.6 SURGE IMMUNITY TEST SYSTEM..... 25
9.7 APPLICATION OF ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST..... 26
9.8 APPLICATION OF CONDUCTED SUSCEPTIBILITY TEST..... 26
9.9 DEVIATIONS FROM THE STANDARD..... 26
10. TEST DATA.....27
10.1 ELECTROSTATIC DISCHARGE IMMUNITY TEST (IEC 61000-4-2).....27
10.2 RADIATED SUSCEPTIBILITY TEST (IEC 61000-4-3).....28
10.3 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST (IEC 61000-4-8)..... 28
10.4 VOLTAGE DIPS, SHORT INTERRUPTIONS IMMUNITY TESTS (IEC 61000-4-11)..... 28
10.5 SURGE IMMUNITY TEST (IEC 61000-4-5).....29
10.6 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (IEC 61000-4-4)..... 29
10.7 CONDUCTED SUSCEPTIBILITY TEST (IEC 61000-4-6)..... 30
11. TEST RESULTS.....31
11.1 IEC 61000-4-2 ELECTROSTATIC DISCHARGE IMMUNITY TEST CONFIGURATION..... 31
11.2 IEC 61000-4-3 RADIATED SUSCEPTIBILITY TEST CONFIGURATION.....31
11.3 IEC 61000-4-8 FREQUENCY MAGNETIC FIELD IMMUNITY TEST CONFIGURATION.....31
11.4 IEC 61000-4-11 VOLTAGE DIPS, SHORT INTERRUPTIONS IMMUNITY TESTS CONFIGURATION..... 31
11.5 IEC 61000-4-5 OF SURGE IMMUNITY TEST CONFIGURATION..... 31
11.6 IEC 61000-4-4 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST CONFIGURATION.....32
11.7 IEC 61000-4-6 CONDUCTED SUSCEPTIBILITY TEST CONFIGURATION.....32
APPENDIX A - EUT PHOTOGRAPHS.....33
EUT – EXTERNAL VIEW 1.....33
EUT - EXTERNAL VIEW 2..... 33
EUT - EXTERNAL VIEW 3..... 34
EUT - INTERNAL VIEW 1.....34
EUT - INTERNAL VIEW 2.....35
EUT - INTERNAL VIEW 3.....35
EUT - INTERNAL VIEW 4.....36
EUT - INTERNAL VIEW 5.....36
PPENDIX B – TEST SETUP PHOTOGRAPHS.....37

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	SHENZHEN ZHONGKE CENTURY TECHNOLOGY CO., LTD
Address of applicant:	2th floor, NO.4 Building, Fu'an third Industrail area, Fuyong, Bao'an, Shenzhen
Manufacturer:	SHENZHEN ZHONGKE CENTURY TECHNOLOGY CO., LTD
Address of manufacturer:	2th floor, NO.4 Building, Fu'an third Industrail area, Fuyong, Bao'an, Shenzhen
Equipment Under Test:	DC pump
Trade Name:	ZKSJ
Model No.:	DC50Q, DC50Q-5000L, DC50Q-4000L, DC50Q-3000L, DC60Q, DC60Q-10000L, DC60Q-8000L, DC60Q-6000L, DC50W, DC50W-80, DC50W-60, DC50W-40, DC50W-25, DC40W, DC40W-10, DC40W-25 The name of the products are different， others are the same.
Power Supply:	DC 24V from adapter

1.2 Test Standards

The following Declaration of Conformity report of EUT is prepared in accordance with

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

The objective of the manufacturer is to demonstrate compliance with the described standards above.

1.3 Test Summary

For the EUT described above.

Table 1: Tests Carried Out Under EN 55014-1: 2006+A1:2009+A2:2011

Standard	Test Items	Status
EN 55014-1: 2006+ A1: 2009+A2: 2011	Disturbance Voltage at The Mains Terminals (150KHz To 30MHz)	√
	Disturbance Power Emission(30MHz-300MHz)	√
	Radiated Disturbances (30MHz To 1000MHz)	√

√ Indicates that the test is applicable
× Indicates that the test is not applicable

Table 2: Tests Carried Out Under EN 55014-2: 1997+A1:2001+A2:2008

Standard	Test Items	Status
EN61000-4-2:2009	Electrostatic discharge Immunity	√
EN61000-4-3:2006+A1:2009	Radiated Susceptibility (80MHz to 1GHz)	√
EN61000-4-8:2010	Power Frequency Magnetic Field Immunity (50/60Hz)	x
EN61000-4-4:2012	Electrostatic Fast Transient/Burst Immunity	√
EN61000-4-5:2006	Surge Immunity	√
EN61000-4-6:2009	Conducted Susceptibility (150KHz to 80MHz)	√
EN61000-4-11:2004	Voltage Dips Short Interruptions Immunity Tests	√

√ Indicates that the test is applicable
× Indicates that the test is not applicable

Table 3: Tests Carried Out Under EN 61000-3-2: 2006+A1:2009+A2: 2009 & EN 61000-3-3: 2013

Standard	Test Items	Status
EN 61000-3-2: 2006+A1:2009+A2: 2009	Harmonic Current	√
EN 61000-3-3: 2013	Voltage Fluctuations	√

√ Indicates that the test is applicable
x Indicates that the test is not applicable

1.4 Test Methodology

All measurement required was performed at laboratory of Shenzhen Microtest Technology Co.,Ltd. at 6F, Zhongbao Building Xiaweiyuan, Gushu, Bao'an, Shenzhen, China.

1.5 Test Facility

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

FCC – Registration No.: 384826

Shenzhen Microtest 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 384826, March 05, 2014.

1.6 Test Equipment List and Details

Table 1: Test Equipment for Emission Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal	Calibration Period
Spectrum Analyzer	ANRITSU	MS2651B	6200238856	2013/11	1 year
EMI Test Receiver	ROHDE&SCHWARZ	ESCS30	100307	2013/11	1 year
LISN	ROHDE&SCHWARZ	ESH3-Z5	100305	2013/11	1 year
Pulse Limiter	ROHDE&SCHWARZ	ESH3-Z2	100305	2013/11	1 year
Bilog Antenna	SCHWARZBECK	VULB 9163	9163-194	2013/11	1 year
50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200283933	2013/11	1 year
Power Clamp	ROHDE&SCHWARZ	MDS21	100142	2013/11	1 year
Loop Antenna	Laplace Instrument Ltd	RF300	8006	2013/11	1 year
Cable	Resenberger	N/A	NO.1	N/A	N/A
Cable	SCHWARZBECK	N/A	NO.2	N/A	N/A
Cable	SCHWARZBECK	N/A	NO.3	N/A	N/A
DC Power Filter	DuoJi	DL2×30B	N/A	N/A	N/A
Single Phase Power Line Filter	DuoJi	FNF 202B30	N/A	N/A	N/A
3 Phase Power Line Filter	DuoJi	FNF 402B30	N/A	N/A	N/A
AC Power Source	California Instruments	5001iX-400	55689	2013/11	1 year
Test analyzer	California Instruments	PACS-1	72254	2013/11	1 year

Table 2: Test Equipment for Immunity Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal	Calibration Period
ESD Tester	HAEFELY	PESD 1610	H4001552	2013/11	1 year
EMCPRO System	Thermo	PRO-BASE	0403271	2013/11	1 year
Capacitive Clamp	Thermo	PRO-CCL	0403272	2013/11	1 year
Coupler decoupler for telecom lines	Thermo	CM-TEL-CD	0403273	2013/11	1 year
Magnetic field Tester	HAEFELY	MAG 100	150577	2013/11	1 year
AC Transformer	CHOKUN	TDGC2J-5	N/A	2013/11	1 year
Signal Generator	IFR	2032	203002/100	2013/11	1 year
Amplifier	AR	150W1000	301584	2013/11	1 year
Dual Directional Coupler	AR	DC6080	301508	2013/11	1 year
Power Head	AR	PH2000	301193	2013/11	1 year
Power Meter	AR	PM2002	302799	2013/11	1 year
Transmitting Antenna	AR	AT1080	28570	2013/11	1 year
Simulator	EMTEST	CWS 500C	0900-12	2013/11	1 year
CDN	EMTEST	CDN-M2	510010010010	2013/11	1 year
CDN	EMTEST	CDN-M3	0900-11	2013/11	1 year
Injection Clamp	EMTEST	F-2031-23MM	368	2013/11	1 year
Attenuator	EMTEST	ATT 6	0010222A	2013/11	1 year

2. SYSTEM TEST CONFIGURATION

2.1 Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

2.2 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software offered by manufacture, can let the EUT being normal operation.

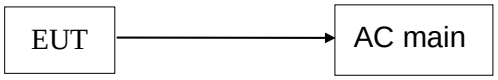
2.3 Special Accessories

As shown in section 2.5, interface cable used for compliance testing is shielded as normally supplied by SHENZHEN ZHONGKE CENTURY TECHNOLOGY CO., LTD its respective support equipment manufacturers.

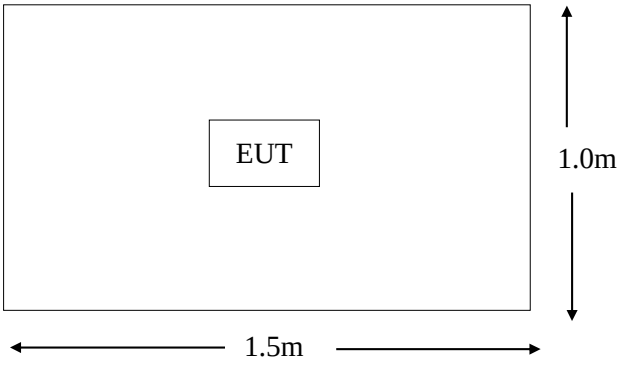
2.4 Equipment Modifications

The EUT tested was not modified by MTI.

2.5 Configuration of Test System



2.6 Test Setup Diagram



All setup please see the section 2.5.

3. RADIATED DISTURBANCES

3.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is ±4.0 dB.

3.2 Limit of Radiated Disturbances

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dBμV/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.

3.3 EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup accordance with the CISPR 16-1: 2002, CISPR16-2: 2002. The specification used was EN 55014-1 Class B limits.

The EUT was placed on the center of the test table.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

3.4 Test Receiver Setup

According to EN 55014-1 rules, the frequency was investigated from 30 to 1000 MHz. During the radiated emission test, the test receiver was set with the following configurations:

Test Receiver Setting:

Detector……..Peak & Quasi-Peak
IF Band Width……..120 KHz
Frequency Range……30MHz to 1000MHz
Turntable Rotated……0 to 360 degrees

Antenna Position:

Height……1m to 4m
Polarity……...Horizontal and Vertical

3.5 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -10 dB μ V of specification limits), and are distinguished with a "**QP**" in the data table.

3.6 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB μ V means the emission is 7dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Class B Limit –Corr. Ampl.

3.7 Radiated Emissions Test Result

Temperature (℃)	22~23
Humidity (%RH)	50~54
Barometric Pressure (mbar)	950~1000
EUT	DC pump
M/N	DC50Q
Operating Mode	Normal

Test data see following pages

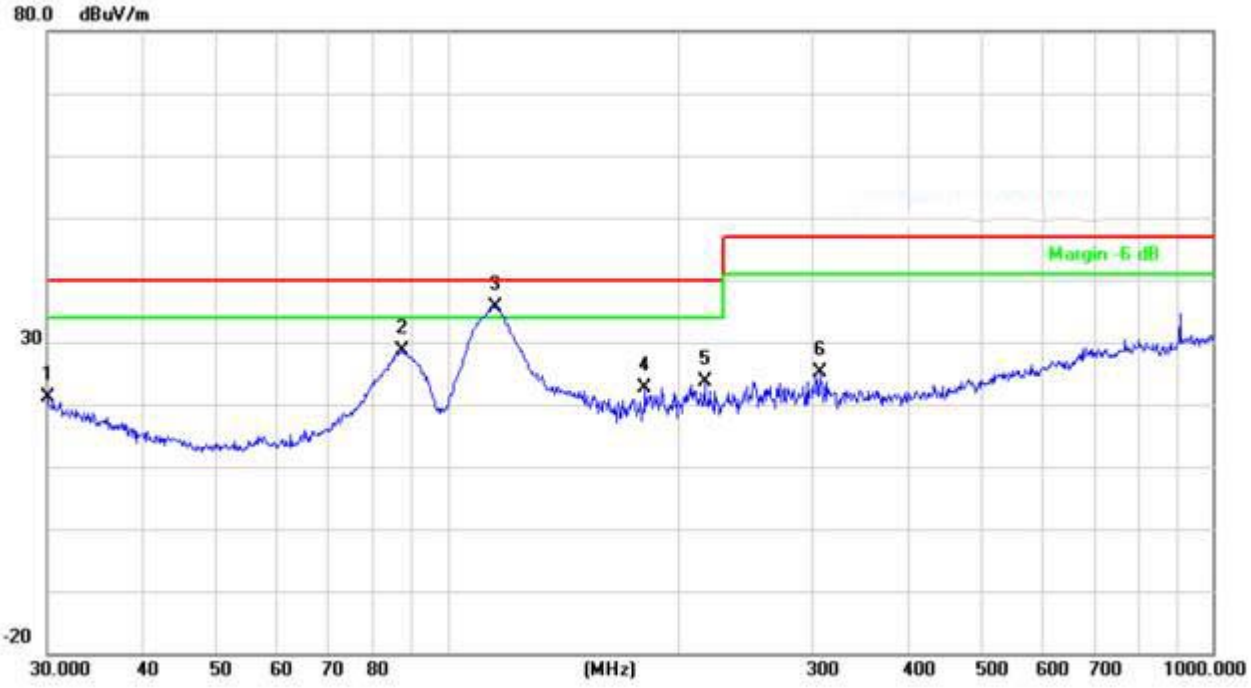
Remark: (1) When PK reading is less than relevant limit 20dB, the QP reading and AV reading will not be recorded.
(2) Where QP reading is less than relevant AV limit, the AV reading will not be measured

3.8 Test Result

Pass
Please refer to the following pages.

Radiated Emission Test Data

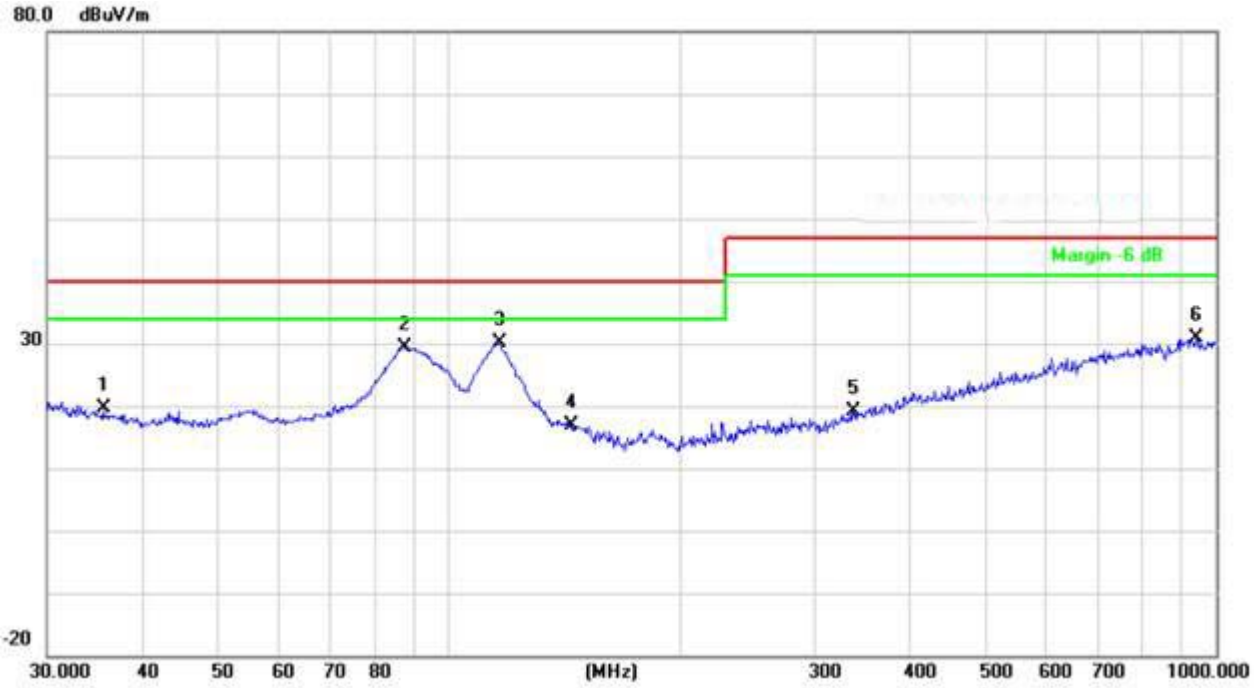
EUT: DC pump
M/N: DC50Q
Operating Condition: Normal
Test Site: 3m CHAMBER
Operator: Shine
Comment: Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		30.0000	35.14	-13.96	21.18	40.00	-18.82	peak			
2		87.1115	51.41	-22.86	28.55	40.00	-11.45	peak			
3	*	115.7256	57.95	-22.23	35.72	40.00	-4.28	peak			
4		181.2834	43.14	-20.62	22.52	40.00	-17.48	peak			
5		216.7828	43.33	-19.67	23.66	40.00	-16.34	peak			
6		306.7536	42.02	-16.83	25.19	47.00	-21.81	peak			

Radiated Emission Test Data

EUT: DC pump
M/N: DC50Q
Operating Condition: Normal
Test Site: 3m CHAMBER
Operator: Shine
Comment: Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		35.4992	36.96	-17.37	19.59	40.00	-20.41	peak			
2		87.7248	52.31	-22.82	29.49	40.00	-10.51	peak			
3	*	116.5400	52.30	-22.29	30.01	40.00	-9.99	peak			
4		144.8418	38.55	-21.59	16.96	40.00	-23.04	peak			
5		337.2155	34.57	-15.39	19.18	47.00	-27.82	peak			
6		942.1304	35.66	-4.83	30.83	47.00	-16.17	peak			

4. DISTURBANCE POWER EMISSION

4.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is ±4.0 dB.

4.2 Limit of Radiated Disturbances (Class B)

Frequency (MHz)	Limits dB(pW)	
	Quasi-peak Value	Average Value
30-300	45 Increasing Linearly with Frequency to 55 (QP)	35 Increasing Linearly with Frequency to 45 (AV)

4.3 EUT Setup

The EUT is placed on a table which is 80cm above the ground and away from other metallic surface at least 0.8m. It is connected to the power mains through an extension cord of 6m min. The absorber clamp clamps the cord and moves from the far end to the EUT to measure the disturbing energy emitted from the cord.

4.4 Test Receiver Setup

According to J55015 (20) rules, the frequency was investigated from 30 to 300 MHz. During the radiated emission test, the test receiver was set with the following configurations:

Test Receiver Setting:

Detector……..Peak & Quasi-Peak
IF Band Width……..120 KHz
Frequency Range……30MHz to 300MHz

4.5 Test Procedure

The EUT is placed on a table which is 80cm above the ground and away from other metallic surface at least 0.8m. It is connected to the power mains through an extension cord of 6m min. The absorber clamp clamps the cord and moves from the far end to the EUT to measure the disturbing energy emitted from the cord.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -10 dBμV of specification limits), and are distinguished with a "**QP**" and "**AVG**" in the data table.

4.6 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Class B Limit –Corr. Ampl.

4.7 DISTURBANCE POWER EMISSION Test Result

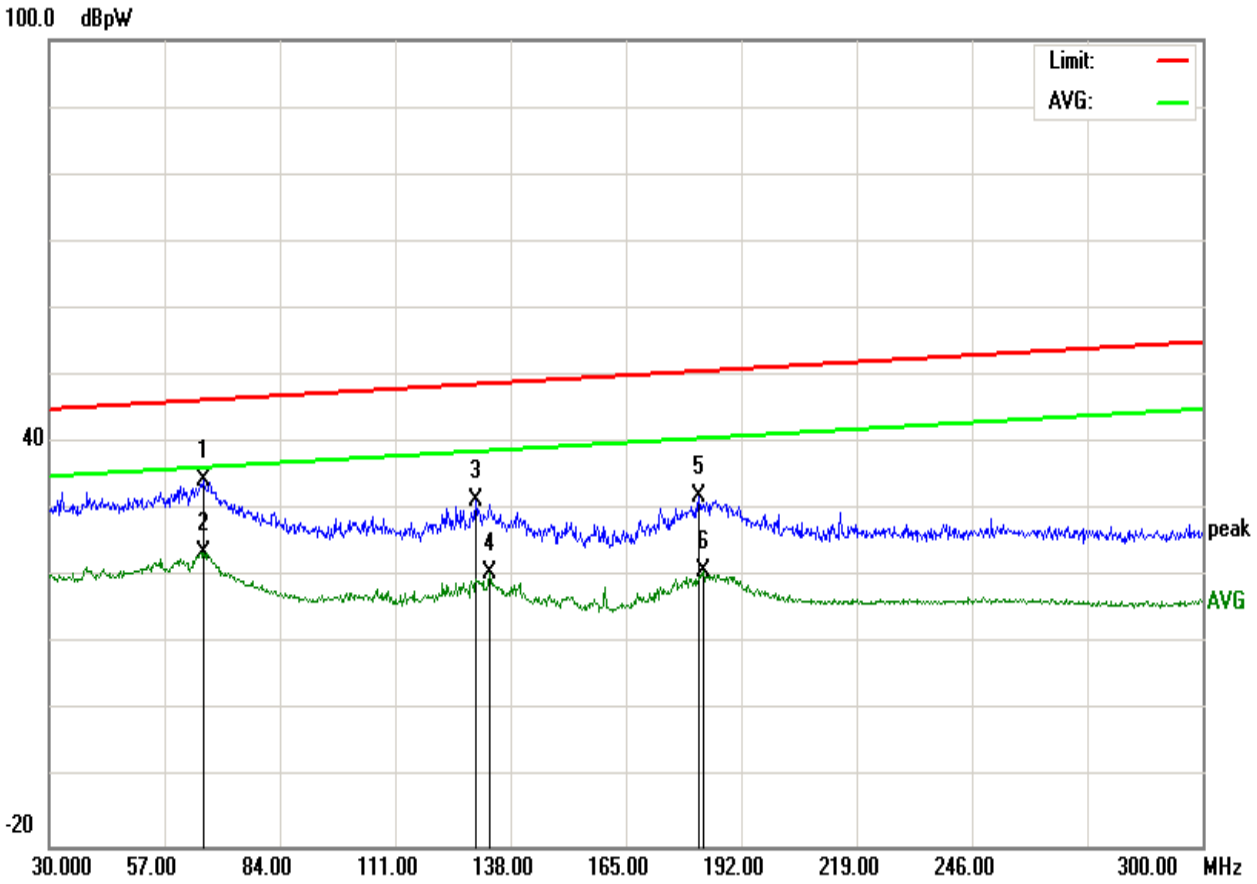
Temperature (℃)	22~23
Humidity (%RH)	50~54
Barometric Pressure (mbar)	950~1000
EUT	DC pump
M/N	DC50Q
Operating Mode	Power Line

Test data see following pages

Remark: Where QP reading is less than relevant AV limit, the AV reading will not be measured

4.8 Test Result

Pass
Please refer to the following pages.



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Position		
		MHz	dBpW	dB	dBpW	dBpW	dB	Detector	cm	Comment
1	*	66.2400	6.78	27.68	34.46	46.34	-11.88	peak		
2		66.2400	-3.98	27.68	23.70	36.34	-12.64	AVG		
3		130.1200	7.27	24.29	31.56	48.71	-17.15	peak		
4		133.4000	-3.62	24.18	20.56	38.83	-18.27	AVG		
5		182.1200	7.01	24.91	31.92	50.63	-18.71	peak		
6		183.2800	-4.02	24.92	20.90	40.68	-19.78	AVG		

5. CONDUCTED DISTURBANCES

5.1. Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is +2.4 dB.

5.2. Limit of Conducted Disturbances (Class B)

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150～0.500	66～56	56～46
0.500～5.000	56	46
5.000～30.00	60	50

5.3. EUT Setup

The setup of EUT is according with CISPR 16-1: 2002, CISPR16-2: 2002 measurement procedure. The specification used was the EN 55014-1 limits.

The EUT was placed center and the back edge of the test table.

The cables were draped along the test table and bundled to 30-40cm in the middle.

The spacing between the peripherals was 10 cm.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

5.4. Instrument Setup

The test receiver was set with the following configurations:
Test Receiver Setting:
Frequency Range……150 KHz to 30 MHz
Detector……..Peak & Quasi-Peak & Average
Sweep Speed……Auto
IF Band Width……..9 KHz

5.5. Test Procedure

During the conducted emission test, the EUT power cord was connected to the auxiliary outlet of the first Artificial Mains.
Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.
All data was recorded in the peak detection mode. Quasi-peak and Average readings were only performed when an emission was found to be marginal (within -10 dBμV of specification limits). Quasi-peak readings are distinguished with a **"QP"**. Average readings are distinguished with a **"AV".**

5.6. Summary of Test Results

According to the data in section 3.6, the EUT complied with the EN 55014-1 Conducted margin, with the worst margin reading of:

EUT Configuration on Test

The EN 55014-1 regulations test method must be used to find the maximum emission during radiated emission test.

DC pump		
Model Number	:	DC50Q DC50Q-5000L, DC50Q-4000L, DC50Q-3000L, DC60Q, DC60Q-10000L, DC60Q-8000L,
Serial Number	:	DC60Q-6000L, DC50W, DC50W-80, DC50W-60, DC50W-40, DC50W-25, DC40W, DC40W-10, DC40W-25
Applicant	:	SHENZHEN ZHONGKE CENTURY TECHNOLOGY CO., LTD

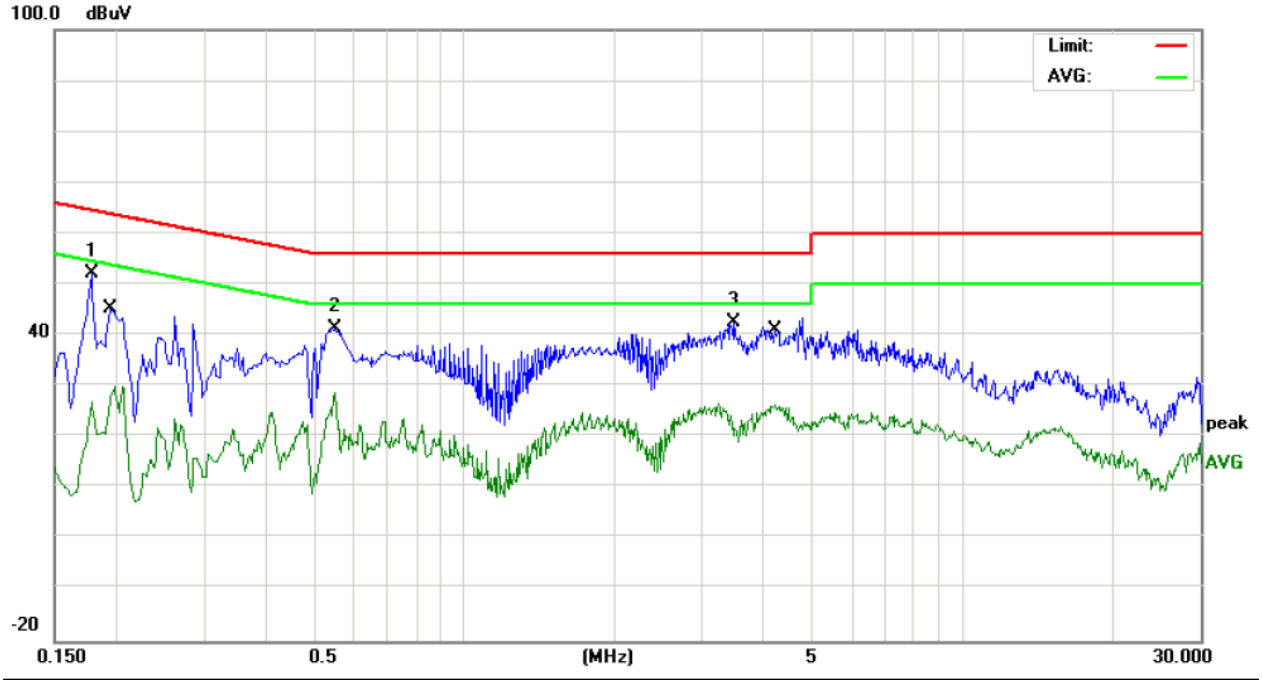
5.7. Test Result

PASS

Please refer to the following pages.

Conduction Emission Test Data

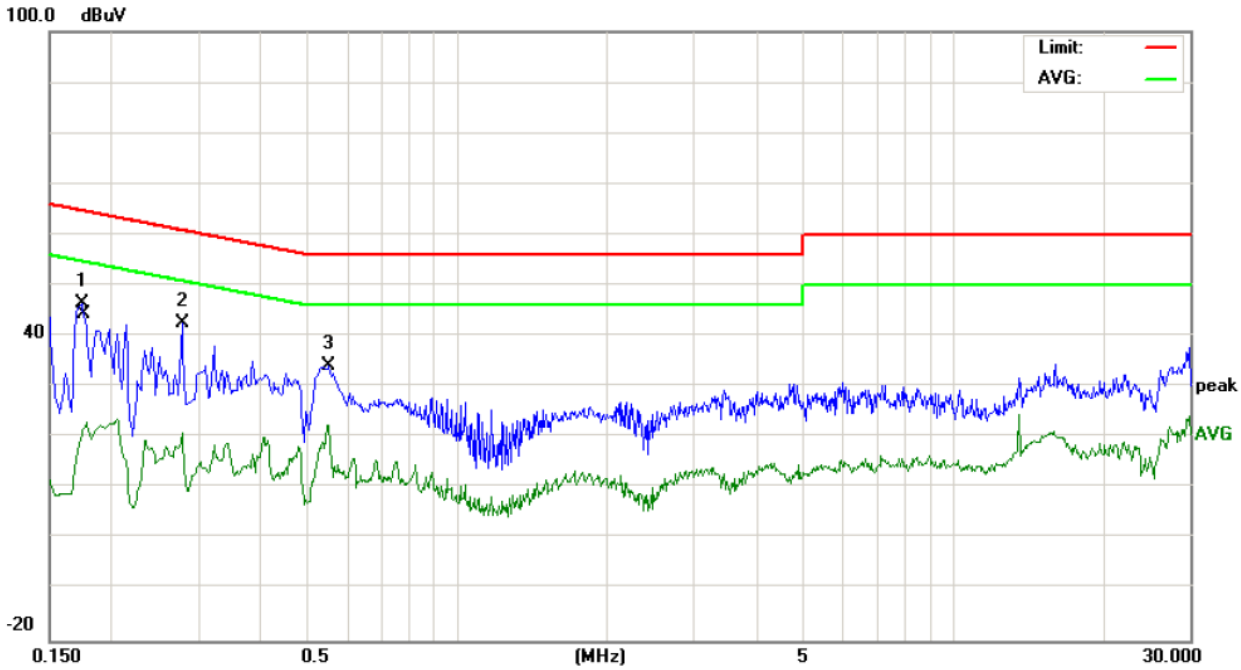
EUT: DC pump
M/N: DC50Q
Operating Condition: Normal
Test Site: 3m Shield
Operator: Amy
POL: LINE



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1780	42.46	9.57	52.03	64.57	-12.54	peak	
2		0.5500	31.79	9.53	41.32	56.00	-14.68	peak	
3		3.4860	32.92	9.58	42.50	56.00	-13.50	peak	
4		0.1945	18.31	9.52	27.83	53.84	-26.01	AVG	
5		0.5500	19.22	9.53	28.75	46.00	-17.25	AVG	
6		4.2100	16.87	9.59	26.46	46.00	-19.54	AVG	

Conduction Emission Test Data

EUT: DC pump
M/N: DC50Q
Operating Condition: Normal
Test Site: 3m Shield
Operator: Amy
POL: NEUTRAL



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1740	37.00	9.56	46.56	64.76	-18.20	peak	
2		0.2779	32.96	9.50	42.46	60.88	-18.42	peak	
3		0.5500	24.73	9.51	34.24	56.00	-21.76	peak	
4		0.1780	13.38	9.55	22.93	54.57	-31.64	AVG	
5		0.2779	11.44	9.50	20.94	50.88	-29.94	AVG	
6		0.5460	13.05	9.51	22.56	46.00	-23.44	AVG	

6. HARMONIC CURRENT TEST

6.1 Application of Harmonic Current Emission

Compliance to these standards ensures that tested equipment will not generate harmonic currents at levels that cause unacceptable degradation of the main environment. This directly contributes to meeting compatibility levels established in other EMC standards, which defines compatibility levels for low-frequency conducted disturbances in low-voltage supply systems.

6.2 Measurement Data

Note: For detailed test data, refer to the following pages:

Standard used:	EN/IEC 61000-3-2 Quasi-stationary - Equipment class A
Observation time:	150s
E. U. T.:	DC pump
M/N:	DC50Q
Power Supply:	AC 230V/50Hz
Operation Mode:	Normal

6.3 Test Results

The EUT was subjected to the Harmonic Current test required by EN 61000-3-2.

The EUT measured values of the Harmonic Current test of the input current, shall be compared with the limits given in section 7.0.

PASS

Please refer to the following pages.

Voltech IEC61000-3 Windows Software 1.14.06RC1	
Type of Test:	Fluctuating Harmonics Test - Worst Case Table (2006)
Power Analyzer:	Voltech PM6000 SN: 200006700495 Firmware version: v1.21.07RC2 Channel(s): 1. SN: 090015501951, 28 Adjusted Date: 23 MAR 2011. 2. SN:None Adjusted Date:None 3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None Shunt(s): 1. SN: 091024301771, 4 Adjusted Date: 25 MAR 2011. 2. SN:None Adjusted Date:None 3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None
AC Source:	Mains / Manual Source
Overall Result: **PASS**	

Class	Class A
Class Multiplier	1

Harm	Limit 1	Limit 2	Average Reading	<L1	<L2	Max Reading	<L2	Pass FAIL	Harm	Limit 1	Limit 2	Average Reading	<L1	<L2	Max Reading	<L2	Pass FAIL
2	1.0800A	1.6200A	3.613mA	✓	✓	3.748mA	✓	N/A	3	2.3000A	3.4500A	53.77mA	✓	✓	54.00mA	✓	Pass
4	430.0mA	645.0mA	1.760mA	✓	✓	1.829mA	✓	N/A	5	1.1400A	1.7100A	24.11mA	✓	✓	24.22mA	✓	Pass
6	300.0mA	450.0mA	0.501mA	✓	✓	0.540mA	✓	N/A	7	770.0mA	1.1550A	4.695mA	✓	✓	4.738mA	✓	N/A
8	230.0mA	345.0mA	0.384mA	✓	✓	0.418mA	✓	N/A	9	400.0mA	600.0mA	5.694mA	✓	✓	5.729mA	✓	Pass
10	184.0mA	276.0mA	0.456mA	✓	✓	0.483mA	✓	N/A	11	330.0mA	495.0mA	1.800mA	✓	✓	1.820mA	✓	N/A
12	153.3mA	230.0mA	0.253mA	✓	✓	0.269mA	✓	N/A	13	210.0mA	315.0mA	2.647mA	✓	✓	2.667mA	✓	N/A
14	131.4mA	197.1mA	0.326mA	✓	✓	0.343mA	✓	N/A	15	150.0mA	225.0mA	0.976mA	✓	✓	0.994mA	✓	N/A
16	115.0mA	172.5mA	0.182mA	✓	✓	0.198mA	✓	N/A	17	132.3mA	198.5mA	1.362mA	✓	✓	1.378mA	✓	N/A
18	102.2mA	153.3mA	0.205mA	✓	✓	0.218mA	✓	N/A	19	118.4mA	177.6mA	0.692mA	✓	✓	0.709mA	✓	N/A
20	92.00mA	138.0mA	0.165mA	✓	✓	0.177mA	✓	N/A	21	107.1mA	160.7mA	0.891mA	✓	✓	0.903mA	✓	N/A
22	83.63mA	125.4mA	0.149mA	✓	✓	0.161mA	✓	N/A	23	97.82mA	146.7mA	0.498mA	✓	✓	0.513mA	✓	N/A
24	76.66mA	115.0mA	0.177mA	✓	✓	0.189mA	✓	N/A	25	90.00mA	135.0mA	0.617mA	✓	✓	0.628mA	✓	N/A
26	70.76mA	106.1mA	0.142mA	✓	✓	0.157mA	✓	N/A	27	83.33mA	125.0mA	0.365mA	✓	✓	0.378mA	✓	N/A
28	65.71mA	98.57mA	0.150mA	✓	✓	0.165mA	✓	N/A	29	77.58mA	116.3mA	0.399mA	✓	✓	0.413mA	✓	N/A
30	61.33mA	92.00mA	0.100mA	✓	✓	0.110mA	✓	N/A	31	72.58mA	108.8mA	0.313mA	✓	✓	0.325mA	✓	N/A
32	57.50mA	86.25mA	0.128mA	✓	✓	0.141mA	✓	N/A	33	68.18mA	102.2mA	0.299mA	✓	✓	0.309mA	✓	N/A
34	54.11mA	81.17mA	0.100mA	✓	✓	0.112mA	✓	N/A	35	64.28mA	96.42mA	0.237mA	✓	✓	0.249mA	✓	N/A
36	51.11mA	76.66mA	0.099mA	✓	✓	0.108mA	✓	N/A	37	60.81mA	91.21mA	0.252mA	✓	✓	0.263mA	✓	N/A
38	48.42mA	72.63mA	0.113mA	✓	✓	0.124mA	✓	N/A	39	57.69mA	86.53mA	0.226mA	✓	✓	0.242mA	✓	N/A
40	46.00mA	69.00mA	0.093mA	✓	✓	0.105mA	✓	N/A									

<L1 : Reading is below limit 1.

<L2 : Reading is below limit 2.

N/A : Harmonic current below 0.6% of rated current or 5mA, whichever is greater, are disregarded.

7. VOLTAGE FLUCTUATIONS AND FLICKER TEST

7.1 Application of Voltage Fluctuations and Flicker Test

Compliance to these standards ensures that tested equipment will not generate flickers and voltage change at levels that cause unacceptable degradation of the main environment. This directly contributes to meeting compatibility levels established in other EMC standards, which defines compatibility levels for low-frequency conducted disturbances in low-voltage supply systems.

7.2 Measurement Data

Note: For detailed test data, refer to the following pages:

Standard used	EN/IEC 61000-3-3 Flicker
Short time (Pst)	12 min
Observation time	12 min (1 Flicker measurement)
Flicker meter	AC 230V / 50Hz
E. U. T.	DC pump
M/N:	DC50Q
Power Supply	AC 230V/50Hz
Operation Mode	Normal

Test Result	PASS

7.3 Test Results

The EUT was subjected to the voltage fluctuations and flicker test required by EN 61000-3-3.

The EUT measured values of the Flicker test of the input current, including live current and neutral current, shall be compared with the limits given in section 6.2.

	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.273	0.018	0.220	0

8. IMMUNITY MEASUREMENT INSTRUMENTATION

8.1 Electrostatic Discharge Test System

An EM TEST DITOC0103Z ESD simulator is used for all testing. It is capable of applying Electrostatic discharges in both contact discharge modes to 4 kV and air discharge modes to 8 kV in both positive and negative polarities. This is in accordance with the IEC 61000-4-2 basic EMC publication.

8.2 Radiated Susceptibility Test System

An IFR 2032 signal generator and an Amplifier Research power amplifier are used to provide a signal at the appropriate power and frequency to a transmitting antenna to obtain the required electromagnetic field at the position of the EUT in accordance with the IEC 61000-4-3 basic EMC publication. The field was monitored by Amplifier Research field probe and Amplifier Research PM2002 power meter according the IEC 61000-4-3 standards. In order to judge the performance of the EUT, a set of monitor system is used.

8.3 Power Frequency Magnetic Field Immunity Test System

An HAEFELY MAG 100 Immunity test system is used for all testing. Test level as described in IEC 61000-4-8 titled “Table 1 – Test Levels for continuous field” was chosen. Single turn induction coil in 1m x 1m size was used to generate the magnetic field.

8.4 Voltage Dips, Short Interruptions Immunity Tests System

An EM Test UCS 500-M6 Immunity test system is used for all testing. Test level as described in IEC 61000-4-11, section 5, titled “Test Levels”.

8.5 Surge Immunity Test System

An EM Test UCS 500-M6 Immunity test system is used for all testing. Both positive and negative polarities of voltage up to 2kV were applied to the AC input lines. The coupling network defined in the standard was used.

8.6 Electrical Fast Transient/Burst Immunity Test System

An EM Test UCS 500-M6 Immunity test system is used for all testing. It is capable of applying fast transients to the AC line at any phase angle with respect to the AC line voltage wave form and to attached cables via a capacitive coupling clamp in accordance with the IEC 61000-4-4 basic EMC publication.

8.7 Conducted Susceptibility Test System

An IFR 2032A signal generator and a set of Amplifier Research test system are used for the testing. EUT was tested from 0.15 MHz to 80 MHz with 1kHz sine wave, 80% modulation with 3Vr.m.s. CDN coupling and de-coupling networks was tested. During the tests, injected was applied to power line by using CDNs-6.2.2 method, and I/O lines was injected by using clamp injection-6.2.3.method.

8.8 Equipment Test Table

IEC 61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on a insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.6 by 0.8-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by *0.5-millimeter* thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

IEC 61000-4-3 and IEC 61000-4-4 specify that a tabletop EUT be placed on a non-conducting table 80 centimeters above a ground reference plane and that floor-mounted equipment shall be placed on an insulating support approximately 10 centimeters above a ground plane. During the IEC 61000-4-3 tests, the EUT is positioned on a table in a shielded semi-anechoic test chamber to reduce reflections from the internal surfaces of the chamber. During the IEC 61000-4-4 tests, the EUT is positioned on a table over a ground reference plane in conformance with this requirement.

8.9 Instrument Calibration

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications.

Extensive engineering efforts have been made to ensure test data reliability through Quality Control and regular equipment calibration schedules. However, the application of radio frequency fields and voltages are not without an unavoidable level of uncertainty. These include inaccuracies in antenna factors, chamber imperfections and possible test generator output uncertainties.

9. IMMUNITY TEST PROCEDURES

9.1 EUT and Cable Placement

The EUT and any peripherals are located at the center of the table for tabletop devices and in the center of the ground plane with the insulating support for floor-standing devices. The standards require that interconnecting cables to be connected to available ports of the unit and that the placement of the unit and the attached cables simulate a typical installation so far as to be practical.

9.2 Application of Electrostatic Discharge Immunity Test

The test is conducted in the following order according to the basic standard IEC 61000-4-2: Air Discharge, Direct Contact Discharge, Indirect Contact Horizontal Coupling Plane Discharge, and Indirect Contact Vertical Coupling Plane Discharge. The Electrostatic Discharge test levels are set and discharges for the different test modes are set appropriately. The Electrostatic Discharge is applied to the conductive surface of the computer in which the EUT is enclosed, and along all seams and control surfaces on the computer. When a discharge occurs and an error is caused, the type of error, discharge level and location is recorded.

9.3 Application of Radiated Susceptibility Test

The electromagnetic field is established at the front edge of the EUT. The frequency range is swept from 80 to 1000 MHz using a power level necessary to obtain a 3 volt/meter and 80% amplitude of a 1 kHz sine wave modulated field Strength is directed at the EUT. The test is performed with each of four sides of EUT facing the transmitting antenna. If an error is detected when the susceptible side of the EUT facing the transmitting antenna, the field is reduced until the error is not repeatable, the field is then manually increased until the error begins to occur. This threshold level, the frequency and the error created are noted before continuing. Both horizontal and vertical polarization of the antenna are set on test and measured individually

9.4 Application of Power Frequency Magnetic Field Immunity Test

It is deemed that according to the standard of EN 55014-2, this test is not applicable to the EUT which dose not contain devices susceptible to magnetic fields, such as CRT monitors, Hall elements, electro-dynamic microphone, magnetic field sensor, etc.

9.5 Application of Voltage Dips, Short Interruptions Immunity Tests

The EUT was setup according to the IEC 61000-4-11 and the test shall be done as the procedure described in the standard.

9.6 Surge Immunity Test System

An EM Test UCS 500-M6 Immunity test system is used for all testing. Both positive and negative polarities of voltage up to 2kV were applied to the AC input lines. The coupling network defined in the standard was used.

9.7 Application of Electrical Fast Transient/Burst Immunity Test

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane 2.4 meter by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0 meter ground rod. The ground rod is connected to the test facility's electrical earth.

9.8 Application of Conducted Susceptibility Test

The EUT was setup according to the IEC 61000-4-6 and the test shall be performed with the test generator connected to each of the coupling and Decoupling devices in turn while the other non-excited RF input ports of the coupling devices are terminated by a 50 W load resistor. The frequency range is 150kHz to 80 MHz.

9.9 Deviations from the Standard

No deviations from EN 55014-2 were made when performing the tests described in this report.

10. TEST DATA

10.1 Electrostatic Discharge Immunity Test (IEC 61000-4-2)

Temperature (℃)	22~23
Humidity (%RH)	50~54
Barometric Pressure (mbar)	950~1000
EUT	DC pump
M/N	DC50Q
Operating Mode	Normal

Table 1: Electrostatic Discharge Immunity (Air Discharge)

IEC 61000-4-2 Test Points	Test Levels									
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	-15 kV	+15 kV
Screen 20 points	A	A	A	A	A	A	A	A	/	/
Slot 20 points	A	A	A	A	A	A	A	A	/	/
Other 20 points	A	A	A	A	A	A	B	B	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

IEC 61000-4-2 Test Points	Test Levels									
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	-15 kV	+15 kV
Screws 50 points	A	A	B	B	/	/	/	/	/	/
USB Port 50 points	A	A	B	B	/	/	/	/	/	/

Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

IEC 61000-4-2 Test Points	Test Levels									
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	-15 kV	+15 kV
Front Side	A	A	A	A	/	/	/	/	/	/
Back Side	A	A	A	A	/	/	/	/	/	/
Left Side	A	A	A	A	/	/	/	/	/	/
Right Side	A	A	A	A	/	/	/	/	/	/

Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

IEC 61000-4-2 Test Points	Test Levels									
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	-15 kV	+15 kV
Front Side	A	A	A	A	/	/	/	/	/	/
Back Side	A	A	A	A	/	/	/	/	/	/
Left Side	A	A	A	A	/	/	/	/	/	/
Right Side	A	A	A	A	/	/	/	/	/	/

10.2 Radiated Susceptibility Test (IEC 61000-4-3)

Frequency Range (MHz): 80~1000MHz
Modulation: Amplitude 80%, 1 kHz sinewave
Severity Level: 3V/m

Temperature (℃)	22~23
Humidity (%RH)	50~54
Barometric Pressure (mbar)	950~1000
EUT	DC pump
M/N	DC50Q
Operating Mode	Normal

Frequency Range (MHz)	Front (3 V/m)		Rear (3 V/m)		Left Side (3 V/m)		Right Side (3 V/m)	
80-1000	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
	A	A	A	A	A	A	A	A

10.3 Power Frequency Magnetic Field Immunity Test (IEC 61000-4-8)

Temperature (℃)	22~23
Humidity (%RH)	50~54
Barometric Pressure (mbar)	950~1000
EUT	DC pump
M/N	DC50Q
Operating Mode	Normal

Level	Magnetic Field Strength A/M	X (Horizontal)	Y (Vertical)	Z (Special)
1	1	/	/	/
2	3	A	A	A
3	10	/	/	/
4	30	/	/	/
5	100	/	/	/
X	Special	/	/	/

10.4 Voltage Dips, Short Interruptions Immunity Tests (IEC 61000-4-11)

Temperature (℃)	22~23
Humidity (%RH)	50~54
Barometric Pressure (mbar)	950~1000
EUT	DC pump
M/N	DC50Q
Operating Mode	Normal

Level	U2	td	Phase Angle	N	Pass	Fail
1	95%	250ms	0/90/180/270	3	C	/
2	30%	10ms	0/90/180/270	3	B	/
3	60%	100ms	0/90/180/270	3	C	/

10.5 Surge Immunity Test (IEC 61000-4-5)

Temperature (℃)	22~23
Humidity (%RH)	50~54
Barometric Pressure (mbar)	950~1000
EUT	DC pump
M/N	DC50Q
Operating Mode	Normal

Table 1: Surge Power Supply

Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	/	/	/
2	1kV	±	L-N	A	/
3	2kV	±	L-PE, N-PE	A	/
4	4kV	±	/	/	/

10.6 Electrical Fast Transient/Burst Immunity Test (IEC 61000-4-4)

Temperature (℃)	22~23
Humidity (%RH)	50~54
Barometric Pressure (mbar)	950~1000
EUT	DC pump
M/N	DC50Q
Operating Mode	Normal

IEC 61000-4-4 Test Points		Test Levels (kV)							
		+0. 5	-0. 5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
Power Supply Power Line of EUT	L1	/	/	A	A	/	/	/	/
	L2	/	/	A	A	/	/	/	/
	Earth	/	/	A	A	/	/	/	/
	L1+L2	/	/	A	A	/	/	/	/
	L1 + Earth	/	/	A	A	/	/	/	/
	L2 + Earth	/	/	A	A	/	/	/	/
	L1+L2+Earth	/	/	A	A	/	/	/	/

10.7 Conducted Susceptibility Test (IEC 61000-4-6)

Frequency Range (MHz): 0.15~80MHz
Modulation: Amplitude 80%, 1kHz sinewave
Severity Level: **3**Vr.m.s.

Temperature (℃)	22~23
Humidity (%RH)	50~54
Barometric Pressure (mbar)	950~1000
EUT	DC pump
M/N	DC50Q
Operating Mode	Normal

Level	Voltage Level (e.m.f.) U_0	Pass	Fail
1	1	/	/
2	3	A	/
3	10	/	/
X	Special	/	/

Note:

A. The apparatus shall continue to operate as intended during and after the test. The manufacturer specifies some minimum performance level. The performance level may be specified by the manufacturer as a permissible loss of performance.

B. The apparatus shall continue to operate as intended after the test. This indicates that the EUT does not need to function at normal performance levels during the test, but must recover. Again some minimal performance is defined by the manufacture. No change in operating state or loss or data is permitted.

C. Temporary loss of function is allowed. Operation of the EUT may stop as long as it is either automatically reset or can be manually restored by operation of the controls.

11. TEST RESULTS

The following tests were performed on the DC pump, model: DC50Q*;* the actual test results are contained within the Test Data section of this report.

11.1 IEC 61000-4-2 Electrostatic Discharge Immunity Test Configuration

The EUT was subjected to the electrostatic discharge tests required by EN 55014-2 and all lower levels specified in IEC 61000-4-2.

The EUT continued to perform as intended during and after the application of the ESD.

11.2 IEC 61000-4-3 Radiated Susceptibility Test Configuration

The EUT was subjected to a 3-volt/meter, 80% Amplitude, 1 kHz Sine wave field as required by EN 55014-2 and all lower levels specified in IEC 61000-4-3.

The EUT continued to perform as intended during and after the application of the electromagnetic field.

11.3 IEC 61000-4-8 Frequency Magnetic Field Immunity Test Configuration

The EUT was subjected to the Frequency Magnetic Field Immunity tests required by EN 55014-2 and all lower levels specified in IEC 61000-4-8.

The EUT continued to perform as intended during and after the application of the Frequency Magnetic Field Immunity Test.

11.4 IEC 61000-4-11 Voltage Dips, Short Interruptions Immunity Tests Configuration

The EUT was subjected to the Voltage Dips/Interruptions tests required by EN 55014-2 and all lower levels specified in IEC 61000-4-11.

The EUT continued to perform as intended during and after the application of the Voltage Dips/Interruptions Test.

11.5 IEC 61000-4-5 of Surge Immunity Test Configuration

The EUT was subjected to the Surge Immunity tests required by EN 55014-2 and all lower levels specified in IEC 61000-4-5.

The EUT continued to perform as intended during and after the application of the Surge Immunity Test.

11.6 IEC 61000-4-4 Electrical Fast Transient/Burst Immunity Test Configuration

The EUT was subjected to the electrical fast transient tests required by EN 55014-2 and all lower levels specified in IEC 61000-4-4.

The EUT continued to perform as intended during and after the application of the EFT/B.

11.7 IEC 61000-4-6 Conducted Susceptibility Test Configuration

The EUT was subjected to the Conducted Susceptibility tests required by EN 55014-2 and all lower levels specified in IEC 61000-4-6.

The EUT continued to perform as intended during and after the application of the Conducted Susceptibility Test.

APPENDIX A - EUT PHOTOGRAPHS

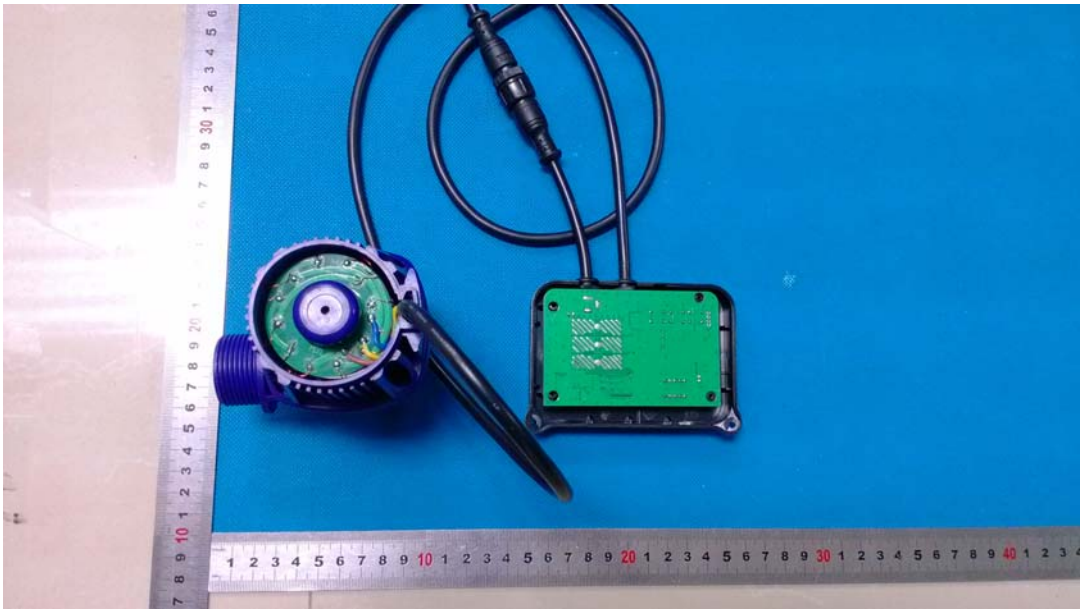
EUT – External View 1

EUT - External View 2

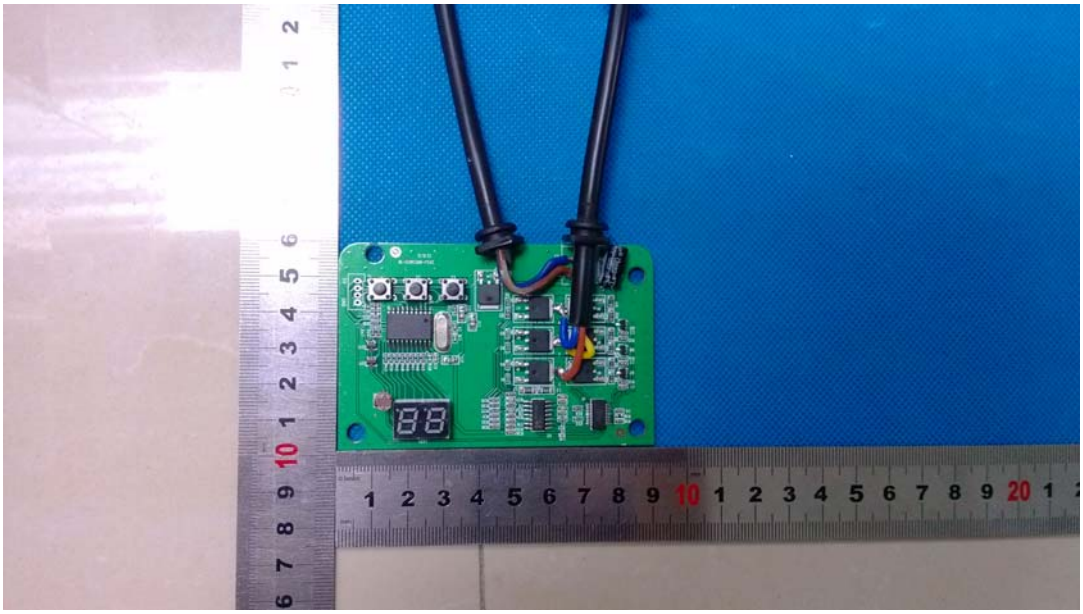
EUT - External View 3

EUT - Internal View 1

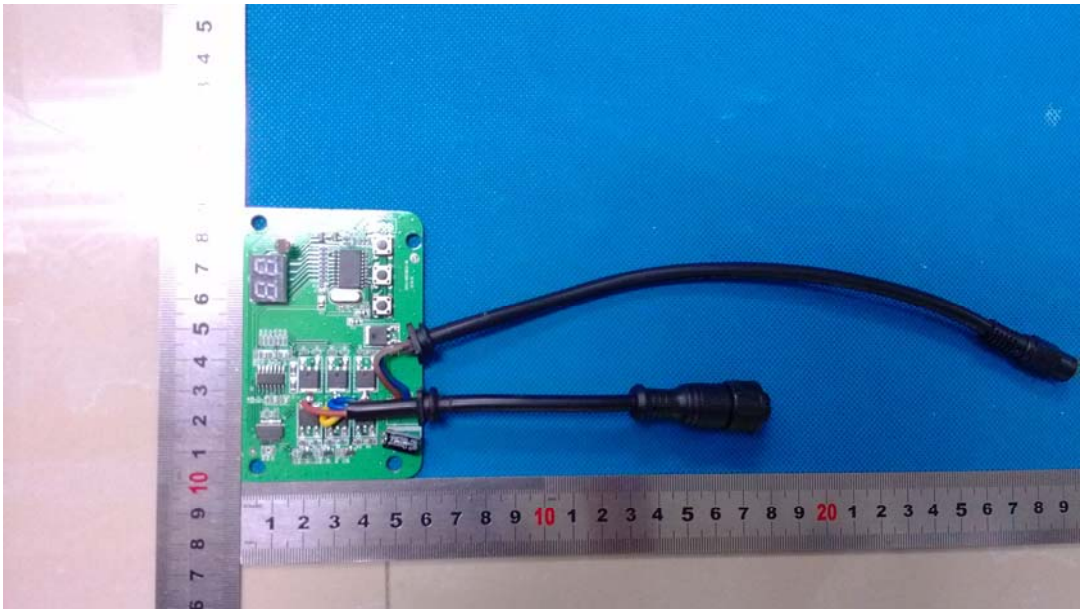
EUT - Internal View 2



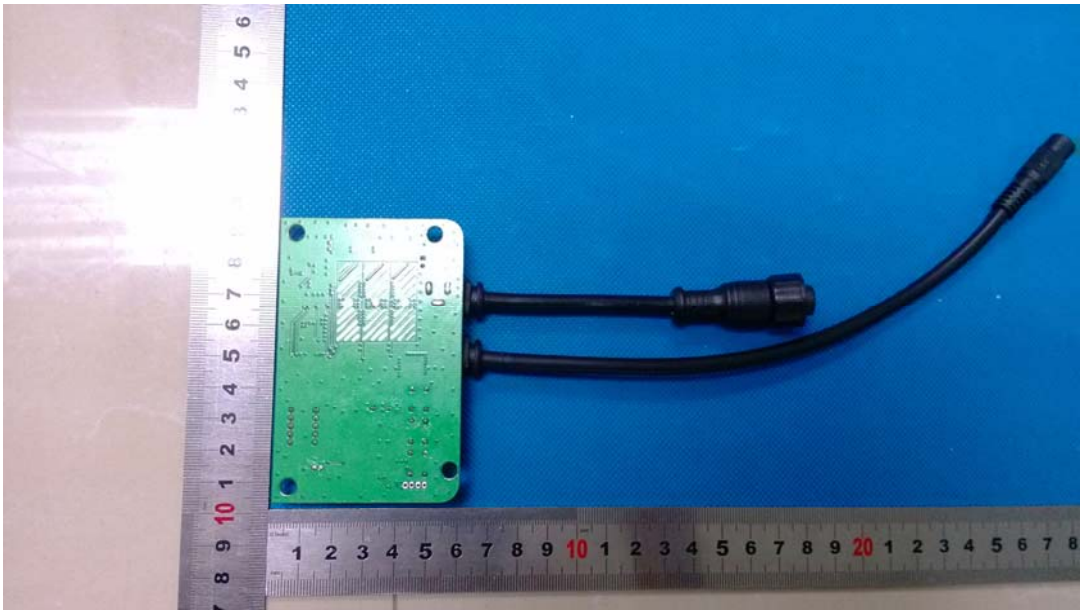
EUT - Internal View 3



EUT - Internal View 4

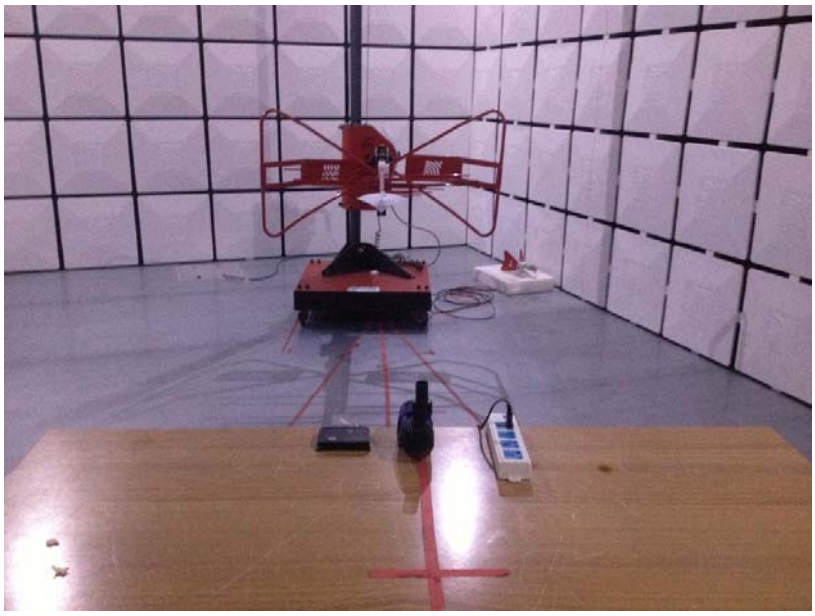


EUT - Internal View 5



PPENDIX B – TEST SETUP PHOTOGRAPHS

Radiated emission test setup photographs



Conducted emission test setup photographs

-------END OF THE REPORT--------