

EMC TEST REPORT

**For
Vectornate Korea Inc.**

ULV Cold Fogger

Model No: DC10

Prepared For : Vectornate Korea Inc.
56 Nanosandan 2-ro, Jangseong-gun, Jinwon-myeon,
Jeollanamdo, 57247, South Korea

Prepared By : Beide (Shenzhen) Product Service Limited
China: 6F, Bldg E, Hourui 3rd Ind Zone, Xixiang, Bao'an Dist,
Shenzhen, China

Report Number: B-E2205A1576
Date of Test: 2022-05-13 to 2022-05-18
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TEST REPORT DECLARATION

Applicant : Vectornate Korea Inc.
Address : 56 Nanosandan 2-ro, Jangseong-gun, Jinwon-myeon, Jeollanamdo,
57247, South Korea
Client No. : CA6130
Manufacturer : Same As Holder
EUT Description : ULV Cold Fogger
Model No. : DC10
Adapter: Input:100-240V~,50/60Hz,0.8A
Ratings Supply : Output:DC16.8V, 1.0A
ULV Cold Fogger: Input: DC16.8V, 1.0A
Remark : Use DC10 do all the tests

Test Procedure Used:

EN 55014-1:2017+A11:2020;
EN IEC 61000-3-2:2019+A1:2021; EN 61000-3-3:2013+A1:2019;
EN 55014-2:2015 (EN 61000-4-2:2009, EN 61000-4-3:2006+A2:2010
EN 61000-4-4:2012, EN 61000-4-5:2014+A1:2017,
EN 61000-4-6:2014, EN 61000-4-11:2004)

The device described above is tested by Beide (Shenzhen) Product Service Limited to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and it's performance criterion. The test results are contained in this test report. Beide (Shenzhen) Product Service Limited is assumed of full responsibility for the accuracy and completeness of these tests. Also, this report shows that the EUT is technically compliant with the EN 55014-1, EN IEC 61000-3-2 and EN 61000-3-3 and EN 55014-2 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Beide (Shenzhen) Product Service Limited.

Note: P=PASS, F=Fail, N/A= Not Applicable

Date of Test : 2022-05-13 to 2022-05-18

Prepared by : Sophia Jiang
(Sophia jiang)

Checked by : Austin Zhong
(Austin zhong)

Approved by : Martin Wang
(Martin wang)



1.TEST RESULTS SUMMARY

Test Results Summary

	Test Items	Test Results
1	Power Line Conducted Emission Test	PASS
2	Disturbance Power Test	PASS
3	Harmonic Current Test	PASS
4	Voltage Fluctuations & Flicker Test	PASS
5	Electrostatic Discharge Test	PASS
6	Radio Frequency Electromagnetic Fields	PASS
7	Electrical Fast Transient/Burst Test	PASS
8	Surge Test	PASS
9	Injected Currents Susceptibility Test	PASS
10	Voltage Dips And Interruptions Test	PASS

Beide



2.GENERAL INFORMATION

2.1.Report Information

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that BEIDE approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that BEIDE in any way guarantees the later performance of the product/equipment.

The sample/s mentioned in this report is/are supplied by applicant, BEIDE therefore assumes no responsibility for the accuracy of information on the brand names, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the applicant at an additional fee. No third part can obtain a copy of this report through BEIDE, unless the applicant has authorized BEIDE in writing to do so.

2.2.Description of Device (EUT)

Description	:	ULV Cold Fogger
Model Number	:	DC10
Applicant	:	Vectornate Korea Inc.
Address	:	56 Nanosandan 2-ro, Jangseong-gun, Jinwon-myeon, Jeollanamdo, 57247, South Korea
Manufacturer	:	Vectornate Korea Inc.
Address	:	56 Nanosandan 2-ro, Jangseong-gun, Jinwon-myeon, Jeollanamdo, 57247, South Korea



2.3.Test Facility

Site Description

Tested by : Beide (Shenzhen) Product Service Limited

Site Location : 6F, Bldg E, Hourui 3rd Ind Zone, Xixiang, Bao'an
Dist, Shenzhen, China

2.4.Test Uncertainty

Conducted Emission Uncertainty = $\pm 2.66\text{dB}$

Radiated Emission Uncertainty = $\pm 3.26\text{dB}$

2.5.Test Condition

Test Mode: ON

2.6.Test Conditions

Temperature: 22°C-28°C

Relative Humidity: 45%-68%



2.7. Performance Criterion

Performance criterion A:

The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Performance criterion B:

The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however. No change of actual operating state or stored data is allowed, of the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Performance criterion C:

Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.



3.TEST INSTRUCMENT USED

3.1.For Power Line Conducted Emission Test (In Shielding Room)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	ROHDE&SCH WARZ	ESCS30	828985/018	2022.05.05	1 Year
2.	LISN	ROHDE&SCH WARZ	ESH2-Z5	834549/005	2022.05.05	1 Year
3.	50Ω Coaxial Switch	ANRITSU	MP59B	M20531	2022.05.05	1 Year
4.	Pulse Limiter	ROHDE&SCH WARZ	ESH3-Z2	100006	2022.05.05	1 Year
5.	Voltage Probe	ROHDE&SCH WARZ	TK9416	N/A	NCR	NCR

3.2.For Disturbance Power Test (In Shielding Room)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum analyzer	ADVANTEST	R3261C	51720141	2022.05.05	1 Year
2.	EMI Test receiver	R&S	ESS	92822-1	2022.05.05	1 Year
3.	Pre Amplifier	Anritsu	MH648A	0983	2022.05.05	1 Year
4.	Absorbing Clamp	R&S	MDS-21	837/23	2022.05.05	1 Year
5.	Absorbing Clamp	R&S	MDS-21	837/24	2022.05.05	1 Year
6.	Absorbing Clamp	Kyoritsu	KT-20	8220	2022.05.05	1 Year
7.	RF Selector	TOYO	NS4000	432099	NCR	NCR
8.	Remote Controller	TOYO	MAC	N/A	NCR	NCR

3.3.For Harmonic / Flicker Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Conditioning Unit	SCHAFFNER	CCN1000-1	23980/7	2022.05.05	1 Year
2.	Signal Phase Impedance Network	SCHAFFNER	INA2152	0929-2	2022.05.05	1 Year
3.	5KVA AC Power Source	SCHAFFNER	NSG1007	2983332	2022.05.05	1 Year

3.4.For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	Noiseken	ESS-200AX	0223	2022.05.05	1 Year



3.5.For Radio Frequency Electromagnetic Fields Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	RF Power Meter Dual Channel	BOONTON	4232A	10539	2022.05.05	1 Year
2.	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	2022.05.05	1 Year
3.	Broad-band horn Antenna	SCHWARZB ECK	BBHA9120 L3F	332	2022.05.05	1 Year
4.	Power Amplifier	PRANA		N/A	2022.05.05	1 Year
5.	Power Amplifier	MILMEGA	AS0102-55	N/A	2022.05.05	1 Year
6.	Signal Generator	AEROFLEX	20238	N/A	2022.05.05	1 Year
7.	Field Strength Meter	HOLADAY	HI-6005	N/A	2022.05.05	1 Year
8.	RS232 Fiber optic modem	HOLADAY	HI-4413P	N/A	2022.05.05	1 Year
9.	Log.-per. Antenna	SCHWARZB ECK	VULP9118 E	N/A	2022.05.05	1 Year

3.6.For Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Ultra Compact Simulator	EM TEST	UCS500M6	0500-19	2022.05.05	1 Year

3.7.For Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Tester	HAEFELY	PSURGE4.1	080107-04	2022.05.05	1 Year

3.8.For Injected Currents Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	IFR	2032	203002/100	2022.05.05	1 Year
2.	Amplifier	A&R	150W1000	301584	2022.05.05	NCR

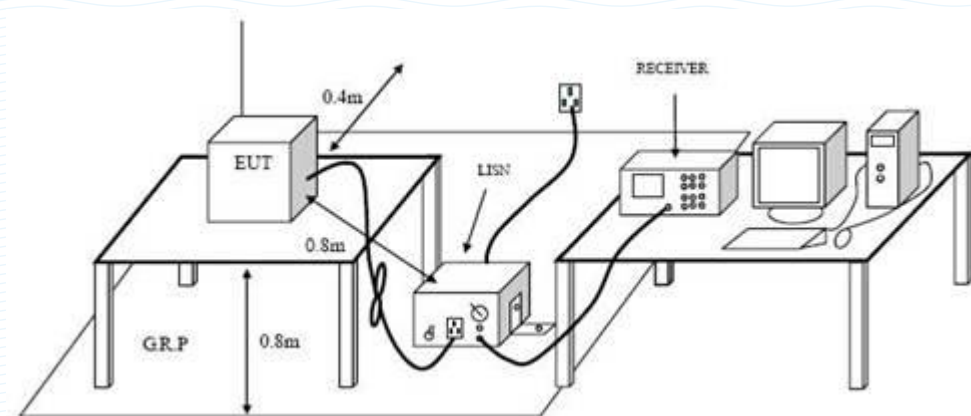
3.9.For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Dips Tester	HEAFELY	PLINE 1610	083732-18	2022.05.05	1 Year



4.POWER LINE CONDUCTED EMISSION TEST

4.1. Block Diagram of Test Setup



4.2. Test Standard

EN 55014-1:2017+A11:2020

4.3.Power Line Conducted Emission Limit

Frequency	At AC Mains Terminals		At Load Terminals	
	Quasi-peak Level dB(μV)	Average Level dB(μV)	Quasi-peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56	56 ~ 46	80	70
500kHz ~ 5MHz	56	46	74	64
5MHz ~ 30MHz	60	50	74	64

Remark: Decreasing linearly with logarithm of frequency.

4.4.EUT Configuration on Test

The following equipments are installed on RF LINE VOLTAGE test to meet EN 55014-1 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

4.5.ULV Cold Fogger (EUT)

Model Number: DC10

Manufacturer: Vectornate Korea Inc.



4.6.Operating Condition of EUT

- 4.6.1. Setup the EUT as shown in Section 4.1.
- 4.6.2. Turn on the power of all equipments.
- 4.6.3. Let the EUT work in test mode (on) and test it.

4.7.Test Procedure

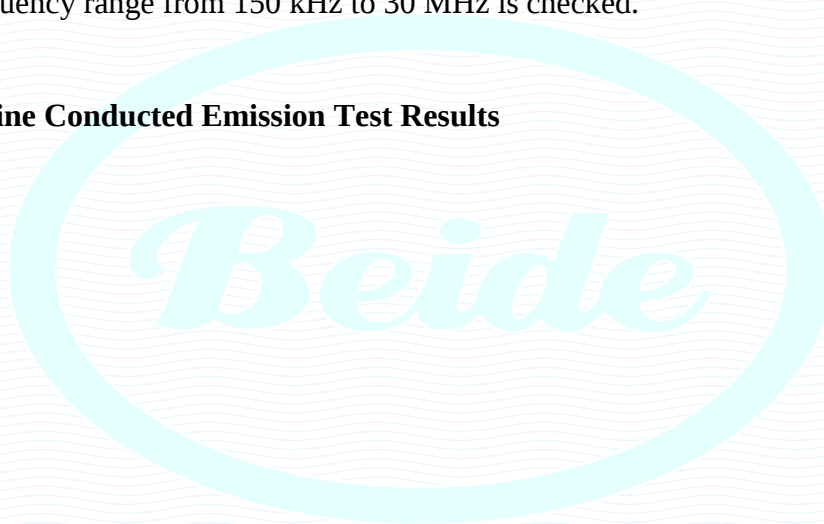
The EUT is put on the ground and connected to the AC mains through a Line Impedance Stabilization Network (L.I.S.N.). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission according to the EN 55014-1 regulations during conducted emission test.

The bandwidth of the test receiver (R&S Test Receiver ESCS30) is set at 10 kHz.

The frequency range from 150 kHz to 30 MHz is checked.

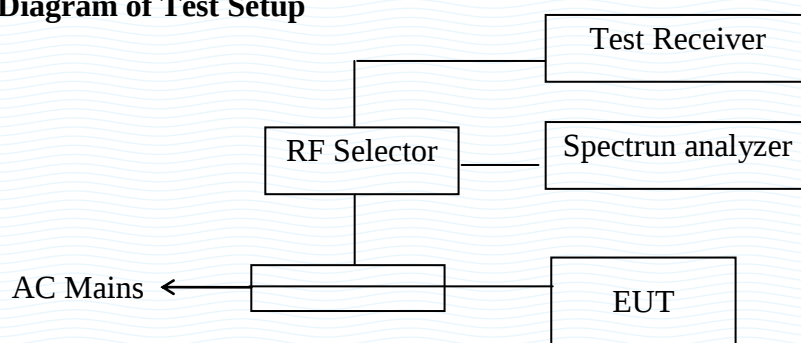
4.8.Power Line Conducted Emission Test Results

PASS.



5.DISTURBANCE POWER TEST

5.1.Block Diagram of Test Setup



5.2.Disturbance Power Test Standard and Limit

5.2.1.Test Standard

EN 55014-1:2017+A11:2020

5.2.2.Test Limit

All emanations from devices or system including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

Frequency MHz	Interference Power Limits (dBpW)	
	Quasi-peak Value	Average Value
30 ~ 300	45 Increasing Linearly with Frequency to 55	35 Increasing Linearly with Frequency to 45

5.3.EUT Configuration on Test

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

The configuration of EUT is the same as used in conducted emission test. Please refer to Section 4.3.

5.4.Operating Condition of EUT

Same as conducted test which is listed in section 4.4. Except the test set up replaced by section 5.1



5.5. Test Procedure

The EUT is placed on the ground and away from other metallic surface at least 0.4m. 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.

The bandwidth of the test receiver(R&S Test Receiver ESS) is set at 120kHz.

All the test results are listed in Section 5.6.

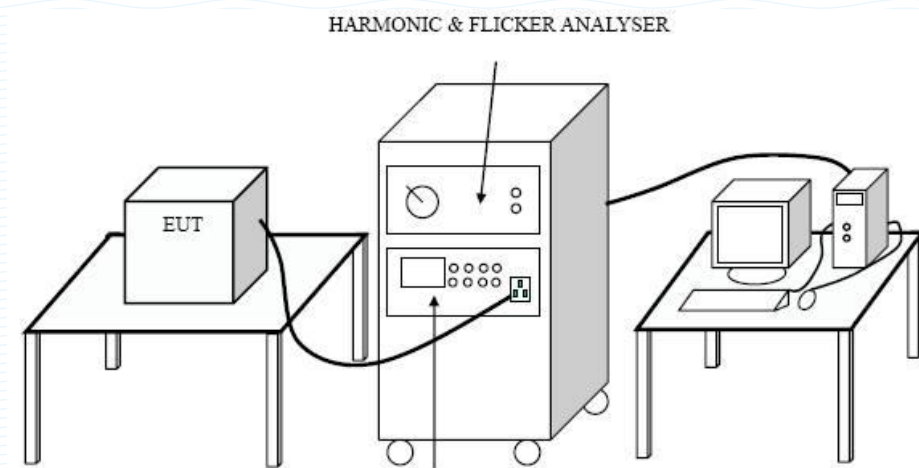
5.6. Test Results

PASS.



6.HARMONIC CURRENT TEST

6.1.Block Diagram of Test Setup



6.2.Test Standard

EN IEC 61000-3-2:2019+A1:2021, Class A

6.3.Operating Condition of EUT

Same as Section 4.4.except the test set up replaced by Section 6.1.

6.4.Test Results

PASS

Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current ≤ 16 A per phase



7.VOLTAGE FLUCTUATIONS & FLICKER TEST

7.1.Block Diagram of Test Setup

Same as Section 6.1.

7.2.Test Standard

EN 61000-3-3:2013+A1:2019

7.3.Operating Condition of EUT

Same as Section 6.3

7.4.Test Results

PASS

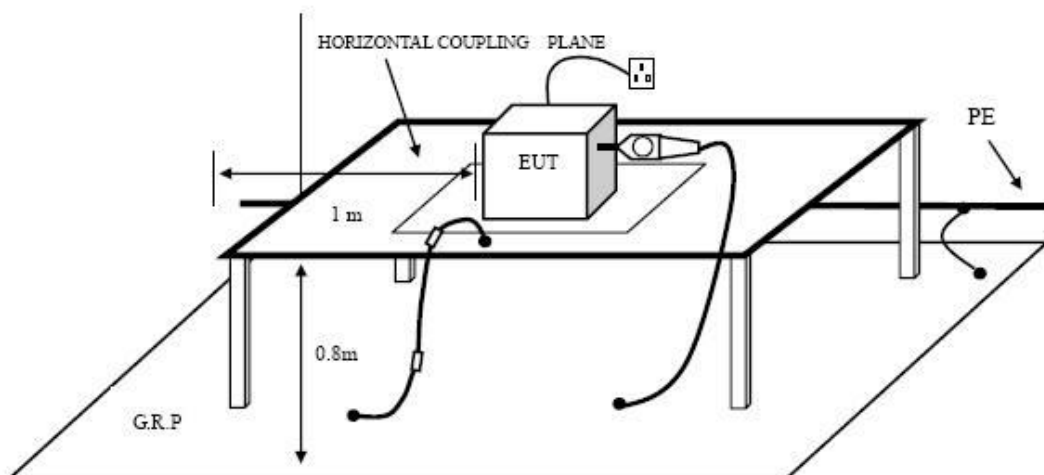
Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, Voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current ≤ 16 A and subject to conditional connection



8.ELECTROSTATIC DISCHARGE TEST

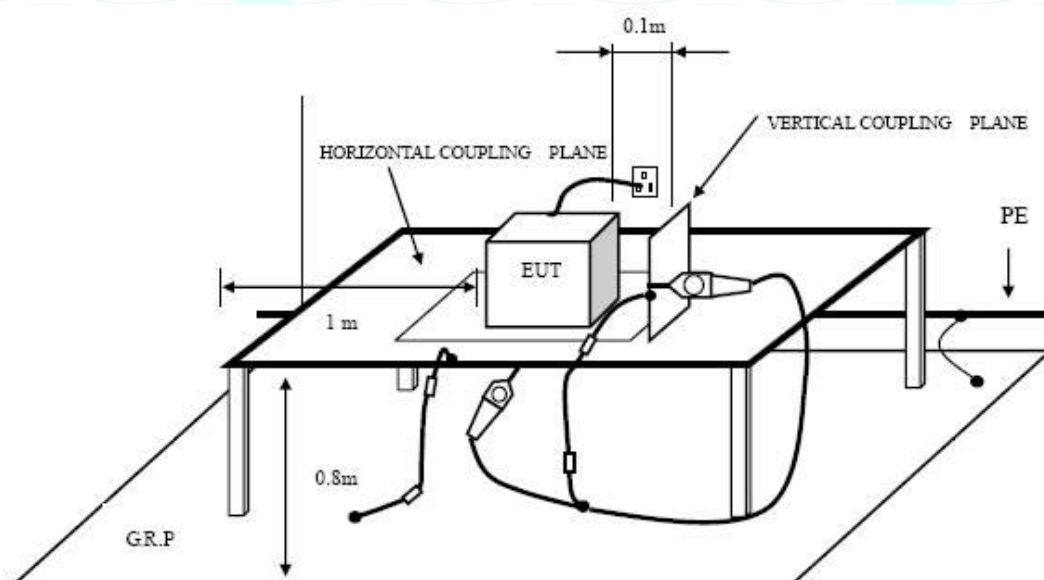
8.1.Block Diagram of Test Setup

8.1.1.Block Diagram of ESD Test Setup (Direct Discharge)



DIRECT DISCHARGE SETUP

8.1.2.Block Diagram of ESD Test Setup (Indirect Discharge)



INDIRECT DISCHARGE SETUP

8.2.Test Standard

EN 55014-2:2015 (EN 61000-4-2:2009)
Severity Level 3 for Air Discharge at 8kV
Severity Level 2 for Contact Discharge at 4kV



8.3. Severity Levels and Performance Criterion

8.3.1. Severity level

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

8.3.2. Performance criterion: **B**

8.4. EUT Configuration on Test

The configurations of EUT are listed in Section 4.4.

8.5. Operating Condition of EUT

8.5.1. Setup the EUT as shown in Section 10.1.

8.5.2. Turn on the power of all equipments.

8.5.3. Let the EUT work in test mode (ON) and test it.

8.6. Test Procedure

8.6.1. Air Discharge:

This test is done on non-conductive surfaces. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

8.6.2. Contact Discharge:

All the procedure shall be same as Section 8.6.1. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

8.6.3. Indirect discharge for horizontal coupling plane

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

8.6.4. Indirect discharge for vertical coupling plane

At least 20 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.



8.7. Test Results

PASS.

Please refer to the following page.



Electrostatic Discharge Test Results

Beide (Shenzhen) Product Service Limited

Date: 2022-05-16

Applicant : Vectornate Korea Inc.	Test Date : 2022-05-16
EUT : ULV Cold Fogger	Temperature : 24°C
M/N : DC10	Humidity : 52%
Power Supply : AC 230V, 50Hz	Test Mode : ON
Test Engineer : Jack	

Air Discharge: $\pm 8\text{kV}$ For each point positive 10 times and negative 10 times discharge.

Contact Discharge: $\pm 4\text{kV}$

Location	Kind A-Air Discharge C-Contact Discharge	Result
Slots 10 points	A	PASS
Surface 10 points	A	PASS
Screw 5 points	C	PASS
HCP 5 points	C	PASS
VCP 5 points	C	PASS
Remark :		

Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

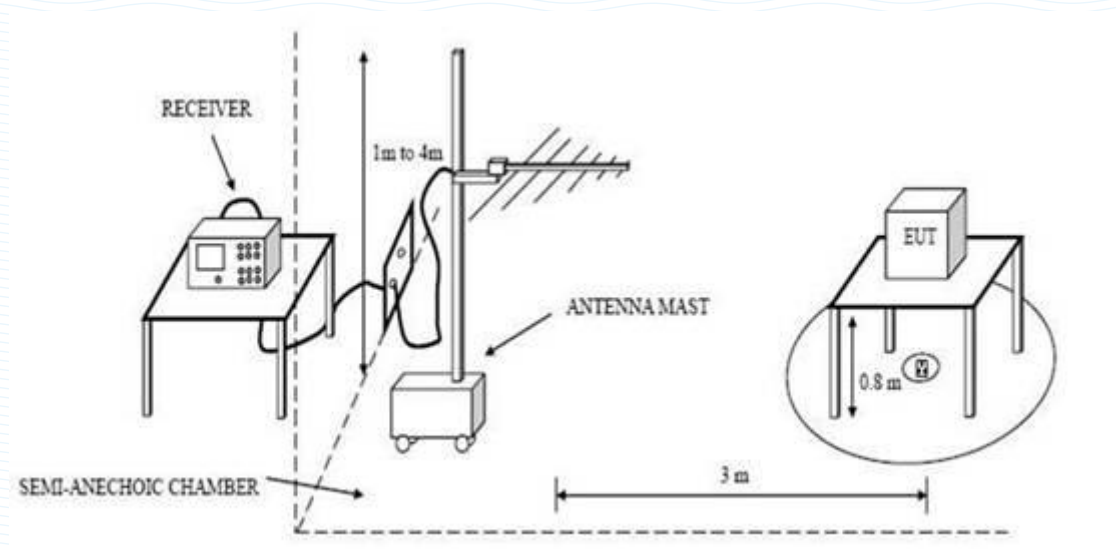
Reviewer:

Austin Zhang



9. RF FIELD STRENGTH SUSCEPTIBILITY TEST

9.1. Block Diagram of Test Setup



9.2. Test Standard

EN 55014-2:2015 (EN 61000-4-3:2006+A2:2010 Severity Level: 2, 3V/m)

9.3. Severity level and Performance criterion

9.3.1. Severity level

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

9.3.2. Performance criterion : A

9.4. EUT Configuration on Test

The test must be used to find severity level in different phrase performance criterion during RF field strength susceptibility test.

The configuration of EUT is same as used in RF field strength susceptibility test.



9.5. Operating Condition of EUT

- 9.5.1. Setup the EUT as shown on Section 9.1.
- 9.5.2. Turn on the power of all equipments.
- 9.5.3. Let the EUT work in test mode (ON) and measure it and test it.

9.6. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor the EUT. All the scanning conditions are as follows :

Condition of Test	Remarks
1. Fielded Strength	3 V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80MHz-6.0GHz
4. Sweeping time of radiated	0.0015 decade/s
5. Dwell Time	1 Sec.

9.7. Test Results

PASS

Please refer to the following page.



RF Field Strength Susceptibility Test Results

Beide (Shenzhen) Product Service Limited

Date: 2022-05-16

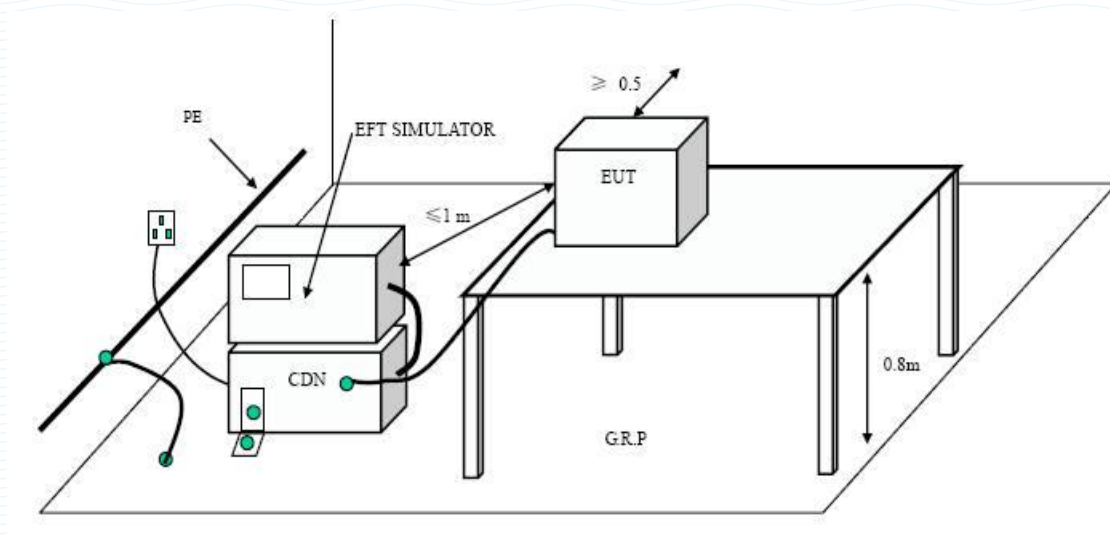
Applicant	: Vectornate Korea Inc.	Test Date	: 2022-05-16
EUT	: ULV Cold Fogger	Temperature	: 24°C
M/N	: DC10	Humidity	: 49%
Test Engineer	: Jack	Test Mode	: ON
Power Supply	: AC 230V, 50Hz	Frequency Range	: /
Modulation:	☒ AM	☐ Pulse	☐ none 1 kHz 80%
Criterion	: A		
	Frequency Range:		
		80MHz-6.0GHz	
Steps	1%		1%
	Horizontal		Vertical
Front	Pass		Pass
Right	Pass		Pass
Rear	Pass		Pass
Left	Pass		Pass

Reviewer : Austin Zhong



10.ELECTRICAL FAST TRANSIENT/BURST TEST

10.1.Block Diagram of Test Setup



10.2.Test Standard

EN 55014-2:2015 (EN 61000-4-4:2012)
Severity Level 2 at 1kV

10.3.Severity Levels and Performance Criterion

10.3.1.Severity level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 kV	0.25 kV
2.	1 kV	0.5 kV
3.	2 kV	1 kV
4.	4 kV	2 kV
X	Special	Special

10.3.2.Performance criterion: **B**

10.4.EUT Configuration on Test

The configurations of EUT are listed in Section 4.4.



10.5.Operating Condition of EUT

10.5.1.Setup the EUT as shown in Section 10.1.

10.5.2.Turn on the power of all equipments.

10.5.3.Let the EUT work in test mode (ON) and test it.

10.6.Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between the EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

10.6.1.For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

10.6.2.For signal lines and control lines ports:

It's unnecessary to test.

10.6.3.For DC output line ports:

It's unnecessary to test.

10.7.Test Results

PASS.

Please refer to the following page.



Electrical Fast Transient/Burst Test Results

Beide (Shenzhen) Product Service Limited

Date: 2022-05-17

Applicant : <u>Vectornate Korea Inc.</u>					Test Date : <u>2022-05-17</u>				
EUT : <u>ULV Cold Fogger</u>					Temperature : <u>24°C</u>				
M/N : <u>DC10</u>					Humidity : <u>52%</u>				
Power Supply : <u>AC 230V, 50Hz</u>					Test Mode : <u>ON</u>				
Test Engineer : <u>Jack</u>									
Inject Place : AC Mains									
Inject Line	Voltage kV	Inject Time(s)	Inject Method	Results	Inject Line	Voltage kV	Inject Time(s)	Inject Method	Results
L	±1	120	Direct	PASS	L+N+PE	±1	120	Direct	PASS
N	±1	120	Direct	PASS					
PE	±1	120	Direct	PASS					
Remark:									

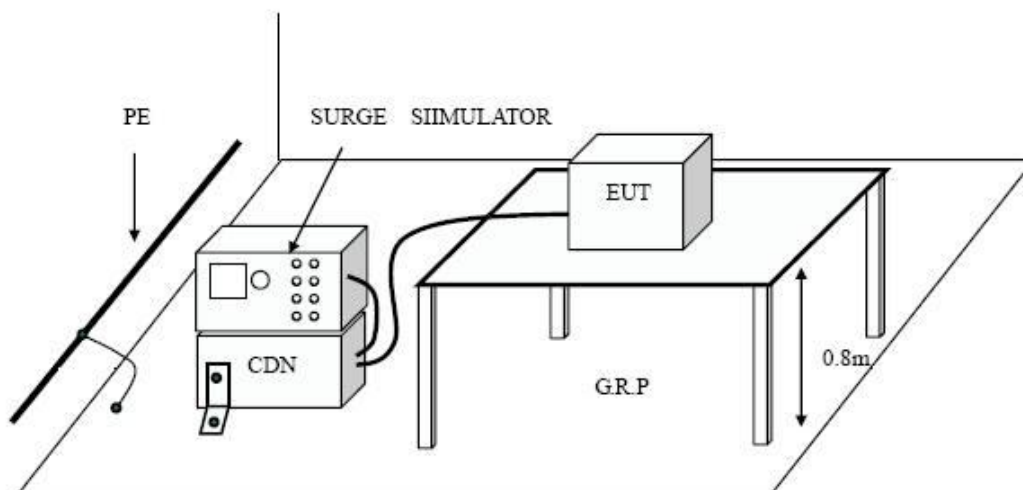
Reviewer:

Austin Zhang



11.SURGE TEST

11.1.Block Diagram of Test Setup



11.2.Test Standard

EN 55014-2:2015 (EN 61000-4-5:2014+A1:2017)

Severity Level: Line to Line: Level 2, 1kV, Line to earth: Level 3, 2kV

11.3.Severity Levels and Performance Criterion

11.3.1.Severity level

Severity Level	Open-Circuit Test Voltage kV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

Performance criterion: **B**

11.4.EUT Configuration on Test

The configurations of EUT are listed in Section 4.4



11.5.Operating Condition of EUT

11.5.1.Setup the EUT as shown in Section 11.1.

11.5.2.Turn on the power of all equipments.

11.5.3.Let the EUT work in test mode (ON) and test it.

11.6.Test Procedure

- 1) Set up the EUT and test generator as shown on Section 11.1.
- 2) For line to line coupling mode, provide a 1.0kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points, and for active line / neutral line to ground are same except test level is 2kV.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

11.7.Test Results

PASS.

Please refer to the following page.



Surge Immunity Test Results

Beide (Shenzhen) Product Service Limited

Date: 2022-05-17

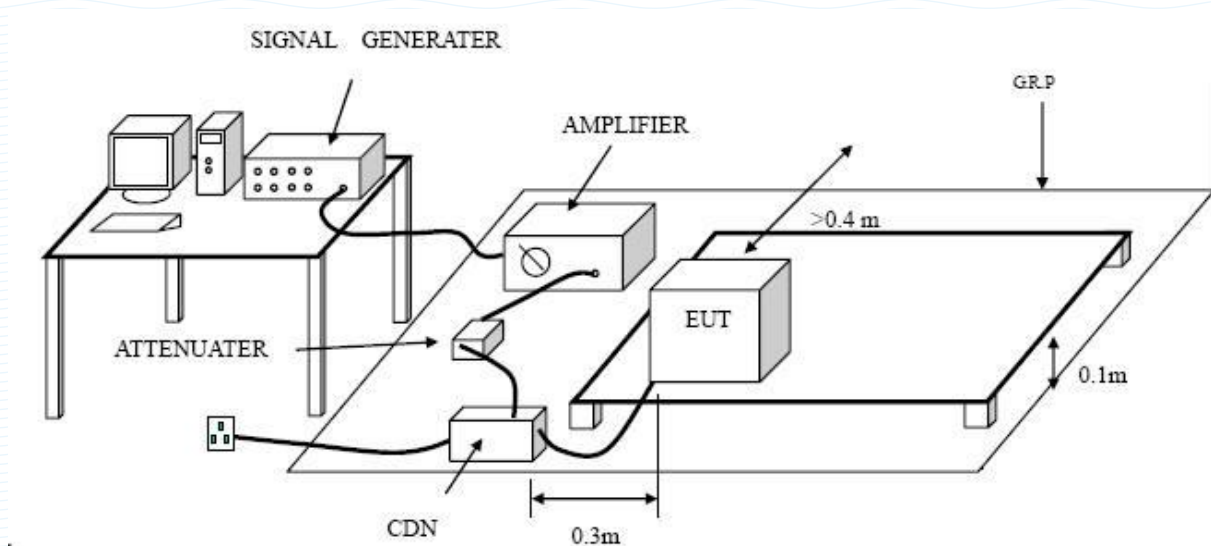
Applicant : <u>Vectornate Korea Inc.</u> EUT : <u>ULV Cold Fogger</u> M/N : <u>DC10</u> Power Supply : <u>AC 230V, 50Hz</u> Test Engineer : <u>Jack</u>					Test Date : <u>2022-05-17</u> Temperature : <u>24°C</u> Humidity : <u>52%</u> Test Mode : <u>ON</u>
Location	Polarity	Phase Angle	No of Pulse	Pulse Voltage (kV)	Result
L+N	±	0	5	1.0	N/A
	±	90	5	1.0	PASS
	±	180	5	1.0	N/A
	±	270	5	1.0	PASS
L+PE N+PE	±	0	5	2.0	N/A
	±	90	5	2.0	PASS
	±	180	5	2.0	N/A
	±	270	5	2.0	PASS
Remark:					

Reviewer: Austin Zhang



12.INJECTED CURRENTS SUSCEPTIBILITY TEST

12.1.Block Diagram of Test Setup



12.2.Test Standard

EN 55014-2:2015 (EN 61000-4-6:2014)
Severity Level 2 at 3V (rms), 0.15MHz ~ 230MHz

12.3.Severity Levels and Performance Criterion

12.3.1.Severity level

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

12.3.2.Performance criterion: A



12.4.EUT Configuration on Test

The configurations of EUT are listed in Section 4.4.

12.5.Operating Condition of EUT

12.5.1.Setup the EUT as shown in Section 12.1.

12.5.2.Turn on the power of all equipments.

12.5.3.Let the EUT work in test mode (ON) and test it.

12.6.Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 12.1.
- 2) Let the EUT work in test mode and test it.
- 3) 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 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150kHz to 230MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave. Suitable for over 1m refrigerators
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

12.7.Test Results

PASS.

Please refer to the following page.



Injected Currents Susceptibility Test Results

Beide (Shenzhen) Product Service Limited

Date: 2022-05-16

Applicant : Vectornate Korea Inc. EUT : ULV Cold Fogger M/N : DC10 Power Supply : AC 230V, 50Hz Test Engineer : Jack			Test Date : 2022-05-16 Temperature : 24°C Humidity : 52%	
Test Mode : ON				
Frequency Range (MHz)	Injected Position	Strength	Criterion	Result
0.15 ~ 230	AC Line	3V(rms), Unmodulated	A	PASS
Remark : 1. Modulation Signal:1kHz 80% AM 2. Standard Applied : EN 61000-4-6:2014		Note:		

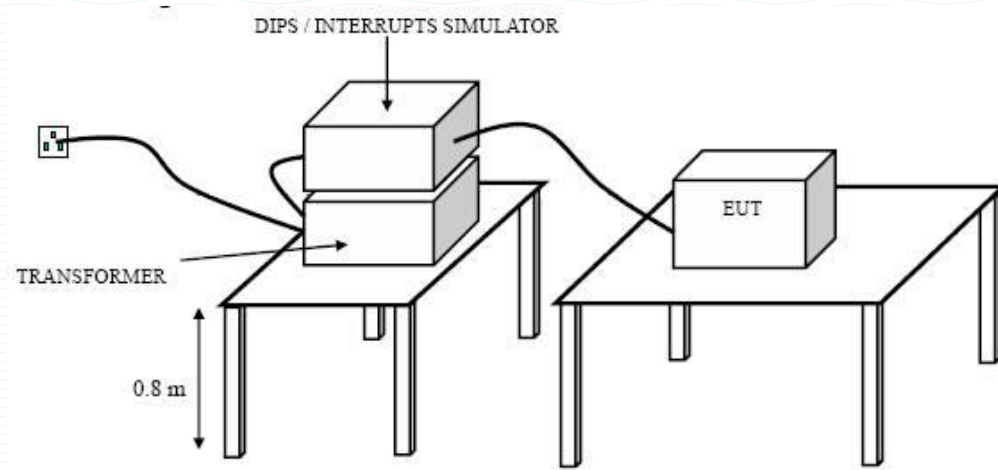
Reviewer:

Austin Zhang



13.VOLTAGE DIPS AND INTERRUPTIONS TEST

13.1.Block Diagram of Test Setup



13.2.Test Standard

EN 55014-2:2015 (EN 61000-4-11:2004)

13.3.Severity Levels and Performance Criterion

13.3.1.Severity level

Test Level $\%U_T$	Voltage dip and short interruptions $\%U_T$	Duration (in period)	
		50Hz	60Hz
0	100	0.5P	0.5P
40	60	10P	12P
70	30	25P	30P

13.3.2.Performance criterion: **B&C**

13.4.EUT Configuration on Test

The configurations of EUT are listed in Section 4.4.



13.5.Operating Condition of EUT

13.5.1.Setup the EUT as shown in Section 13.1.

13.5.2.Turn on the power of all equipments.

13.5.3.Let the EUT work in test mode (ON) and test it.

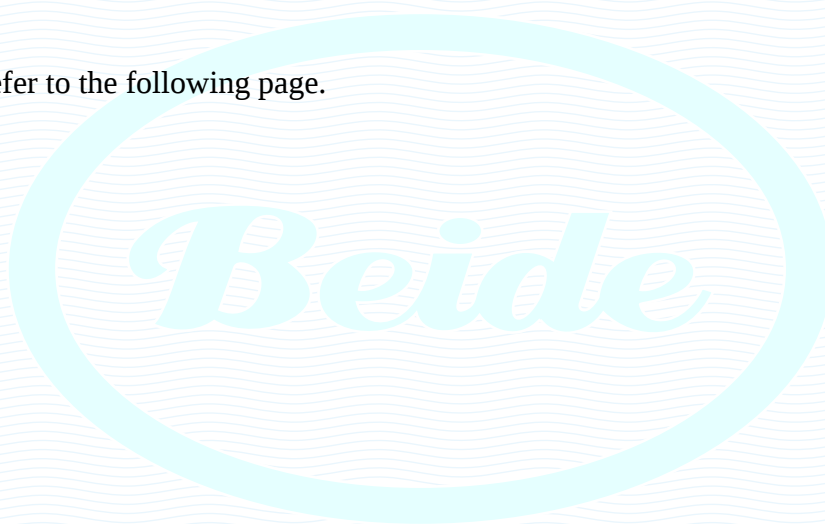
13.6.Test Procedure

- 1) Set up the EUT and test generator as shown on Section 13.1.
- 2) The interruptions are introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

13.7.Test Result

PASS.

Please refer to the following page.



Voltage Dips and Interruptions Test Results

Beide (Shenzhen) Product Service Limited

Date: 2022-05-16

Applicant : <u>Vectornate Korea Inc.</u>				Test Date : <u>2022-05-16</u>		
EUT : <u>ULV Cold Fogger</u>				Temperature : <u>24°C</u>		
M/N : <u>DC10</u>				Humidity : <u>52%</u>		
Power Supply : <u>AC 230V, 50Hz</u>				Test Engineer : <u>Jack</u>		
Test Model: <u>ON</u>						
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in period)		Phase Angle	Criterion	Result
		50Hz	60Hz			
0	100	0.5P	0.5P	0 ~ 360 °	B	PASS
40	60	10P	12P	0 ~ 360 °	B	PASS
70	30	25P	30P	0 ~ 360 °	C	PASS
Remark: U _T is the rated voltage for the equipment.						

Reviewer:

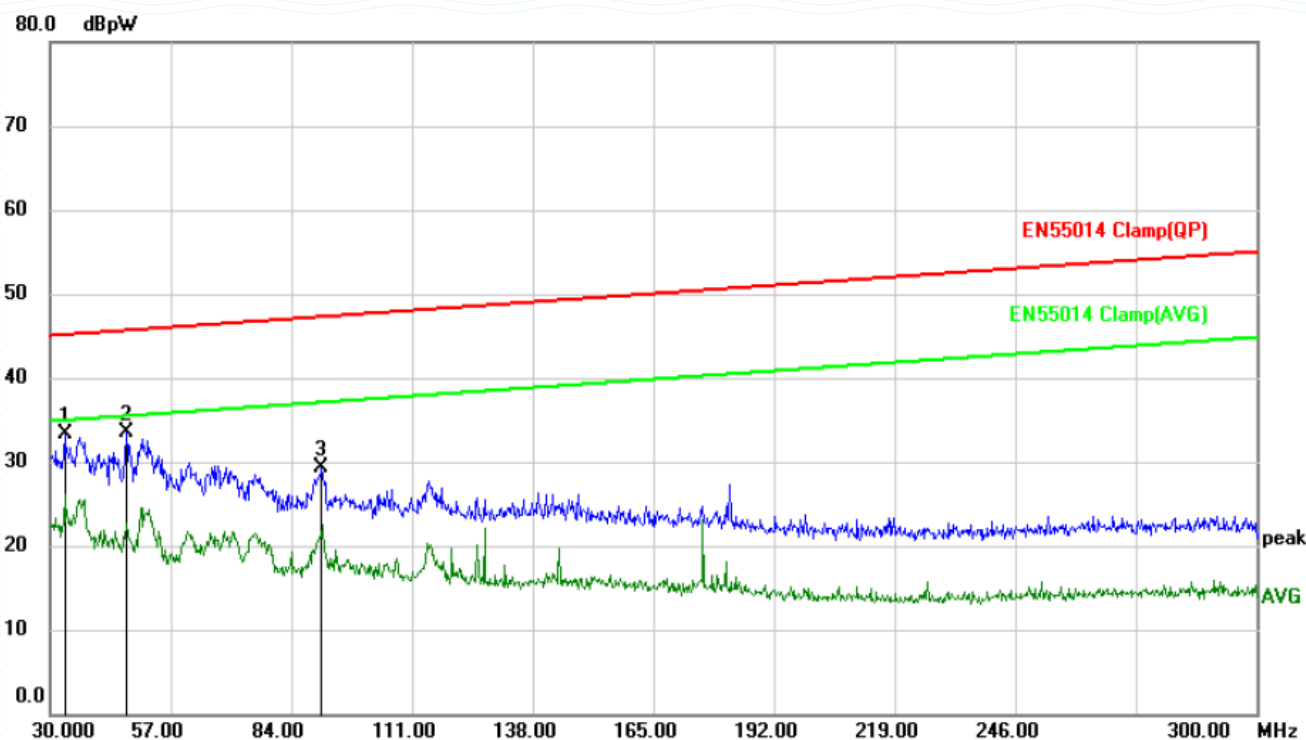
Austin Zhang



APPENDIX I (TEST DATA)



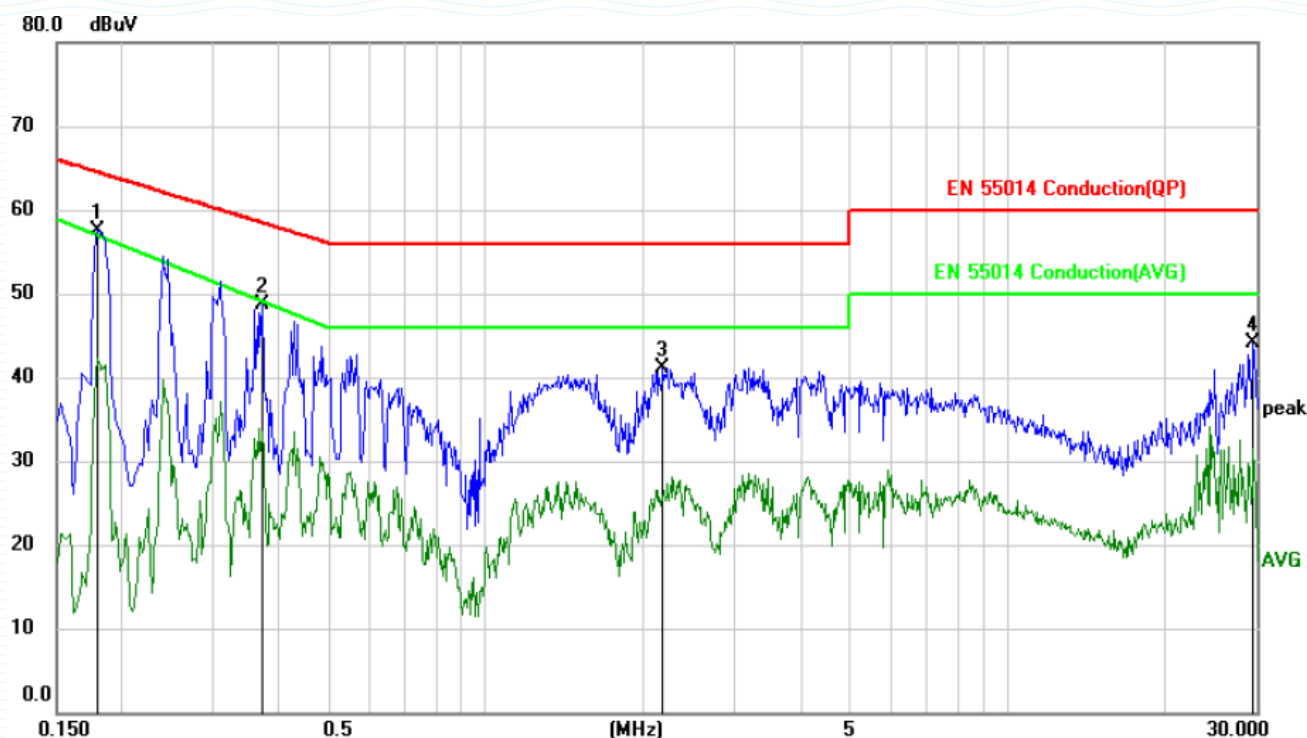
Job No.:		Power Source:	AC 230V
Standard:	EN 55014-1	Temp.(°C)/Hum.(%RH)	24°C/52%RH
Test item:	Conducted Test	Date:	2022/05/18
EUT:	ULV Cold Fogger	Time:	
Model:	DC10	Test By:	Jack
Note:	AC Line		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	Position	
		MHz	dBpW	dB	dBpW	dBpW	dB	Detector	cm
1	*	33.3600	23.61	9.71	33.32	45.12	-11.80	peak	
2		47.1200	23.86	9.73	33.59	45.63	-12.04	peak	
3		90.8000	19.46	9.81	29.27	47.25	-17.98	peak	



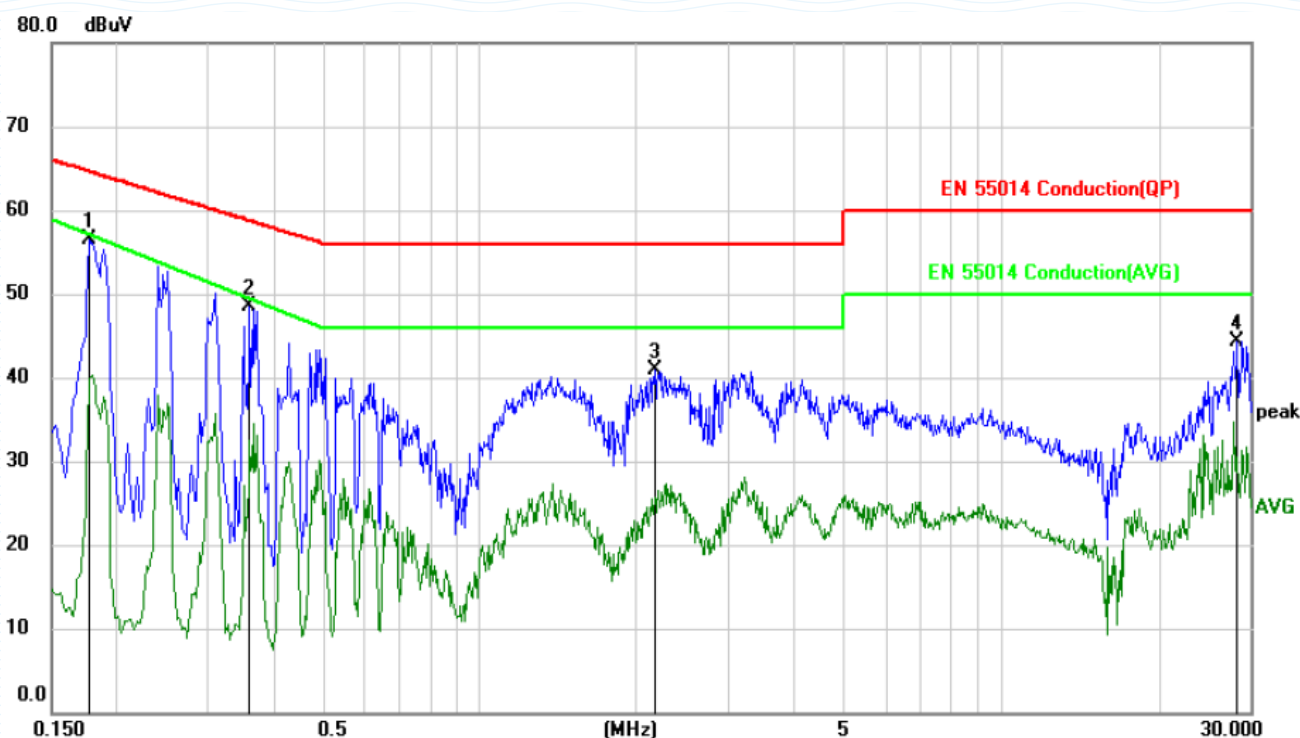
Job No.:		Power Source:	AC 230V
Standard:	EN 55014-1	Temp.(°C)/Hum.(%RH)	24°C/52%RH
Test item:	Conducted Test	Date:	2022/05/18
EUT:	ULV Cold Fogger	Time:	
Model:	DC10	Test By:	Jack
Note:	L		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector Comment
1	*	0.1800	47.54	9.93	57.47	64.49	-7.02	peak
2		0.3720	38.70	9.95	48.65	58.46	-9.81	peak
3		2.1840	31.25	9.89	41.14	56.00	-14.86	peak
4		29.6790	33.48	10.66	44.14	60.00	-15.86	peak



Job No.:		Power Source:	AC 230V
Standard:	EN 55014-1	Temp.(°C)/Hum.(%RH)	24°C/52%RH
Test item:	Conducted Test	Date:	2022/05/18
EUT:	ULV Cold Fogger	Time:	
Model:	DC10	Test By:	Jack
Note:	N		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1770	46.54	9.93	56.47	64.63	-8.16	peak	
2		0.3600	38.64	9.95	48.59	58.73	-10.14	peak	
3		2.1570	30.94	9.89	40.83	56.00	-15.17	peak	
4		28.3890	33.71	10.60	44.31	60.00	-15.69	peak	



APPENDIX II
(Photos of the EUT)



Figure 1
APPEARANCE OF EUT



Figure 2
APPEARANCE OF EUT



Figure 3
APPEARANCE OF EUT



Figure 4
APPEARANCE OF EUT

