Report No.: AOC250606102E

EMC TEST REPORT For								
Cubic	Electrical Appliance Co., Limited							
	HEAT PUMP							
	Test Model: CY50MXCA							
Addit	tional Model No.: See Model List							
Prepared for Address	<ul> <li>Cubic Electrical Appliance Co., Limited</li> <li>Building 16-02, NO. 15 Shunye West Road, Xingtan Town, Shunde, Guangdong, China 528325</li> </ul>							
Prepared by Address	<ul> <li>Shenzhen AOCE Electronic Technology Service Co., Ltd.</li> <li>Room 202, 2nd Floor, No.12th Building of Xinhe Tongfuyu Industrial Park, Fuhai Street, Baoan District, Shenzhen, Guangdong, China</li> </ul>							
Tel Fax Web Mail	: (+86)755-85277785 : (+86)755-23705230 : www.aoc-cert.com : postmaster@aoc-cert.com							
Date of receipt of test sample Number of tested samples Date of Test Date of Report	<ul> <li>May 29, 2025</li> <li>1</li> <li>May 29, 2025 ~ June 6, 2025</li> <li>June 6, 2025</li> </ul>							

# CE

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	EMC TEST REPORT EN IEC 55014-1: 2021						
Requirements for household appliances, electric tools and similar apparatus Part 1:							
	Enlission EN IEC 55014-2: 2021						
Requirements for household appliances, electric tools and similar apparatus Part 2:							
Ir	nmunity - Product family standard						
Report Reference No	: AOC250606102E						
Date Of Issue	: June 6, 2025						
Testing Laboratory Name	: Shenzhen AOCE Electronic Tech	nology Service Co., Ltd.					
Address Testing Location/ Procedure	Address Room 202, 2nd Floor, No.12th Building of Xinhe Tongfuyu Industrial Park, Fuhai Street, Baoan District, Shenzhen, Guangdong, China Testing Location/ Procedure Full application of Harmonised standards						
	Other standard testing method						
Applicant's Name	: Cubic Electrical Appliance Co., Li	mited					
Address	Building 16-02, NO. 15 Shunye Wes Shunde, Guangdong, China 528325	st Road, Xingtan Town,					
Test Specification:							
Standard	Standard EN IEC 55014-1: 2021 EN IEC 61000-3-2:2019+A1:2021+A2:2024 EN 61000-3-3:2013+A1:2019+A2:2021+AC:2022 EN IEC 55014-2: 2021						
Test Report Form No	: AOCEEMC-1.0						
TRF Originator	: Shenzhen AOCE Electronic Techno	logy Service Co., Ltd.					
Master TRF	: Dated 2017-05						
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Test Item Description	HEAT PUMP						
Trade Mark	: N/A						
Test Model	CY50MXCA						
Ratings	Ratings						
Result	: Positive						
Compiled by:	Supervised by:	Approved by:					
David Lik	Kevin Huang	Jackson Fang					
David Liu/ File administrators	Kevin Huang/ Technique principal	Jackson Fang/ Manager					
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#### Model List

049500Y	CP40	MN	CP	50LS	CP70LS		CP90L	S	CP110	S	CP130L	S	CP150LS	
CP170LS	CP21	0LS	CP	260LS	CP260L	S/3	CP2801	s	CP300	CP300LS		S	CP320LS/3	
CP350LS/3	CP35	0LS/3	CP	50ES	CP70ES	;	CP90E	s	CP100	ES	CP110E	s	CP120ES	
CP130ES	CP15	0ES	CP	170ES	CP170E	S/3	CP210	ES	CP210	ES/3	CP2608	ES	CP260ES/3	
CP320ES	CP32	0ES/3	CP	370ES/3	CP400ES/3		CP50S	E	CP70SE		CP90S	Е	CP100SE	_
CP110SE	CP12	0SE	CP	130SE	CP150S	E	CP170	SE .	CP170	SE/3	CP2105	SE .	CP210SE/3	_
CP260SE	CP26	0SE/3	CP	320SE	CP320S	E/3	CP370	SE/3	CP70E	SP	CP90E	SP	CP110ESP	
CP130ESP	CP15	0ESP	CP	170ESP	CP210E	SP	CP240	ESP	CP280	ESP	CP3208	ESP/3	CP370ESP/3	
CP70SP	CP10	0SP	CP	130SP	CP170S	Р	CP210	SP	CP260	SP	CP3205	SP	CP320SP/3	_
CP370SP/3	CP45	0SP/3	CP	600SP/3	CP500C	М	CP7500	MC	CP100	MOC	CP1500	MOC	CP2000CM	
CP70PV	CP90	PV	CP	110PV	CP130P	v	CP150	× د	CP170	vد م	BP50E2	Ζ	BP55EZ	
BP60EZ	BP70	EZ	BP	80EZ	BP90EZ		BP100	Z	BP110	ΞZ	BP125	Z	BP140EZ	
BP160EZ	BP18	5EZ	BP	210EZ	BP240E	z	BP250	Z	BP280	ΞZ	BP3208	Z	BP370EZ	_
BP60VX	BP80	VX	BP	90VX	BP100VX		BP120	/X	BP140VX		BP160\	/X	BP200VX	_
BP210VX	BP24	0VX	BP	280VX	BP320VX		BP370VX BP65VS		S	BP90V	S	BP110VS		
BP140VS	BP16	0VS	BP	180VS	BP210V	s	BP240	/S	BP280	/S	BP320\	/S	BP370VS	_
BP450CM	BP55	0CM	BP	650CM	BP900C	М	BP1100	)CM	BP130	ОСМ	BP30M	Α	BP35MA	_
BP40MA	BP45	MA	BP	30MB	BP35ME	3	BP40M	В	BP45M	В	BP50M	В	BP30MC	_
BP35MC	BP40	МС	BP	45MC	BP30MC	)	BP35M	0	BP40M	0	BP45M	0	BP30MQ	
BP35MQ	BP40	MQ	BP	45MQ	CP40MM	Λ	CP50M	М	BS30M	Х	BS4MX		BS50MX	
BS30MXC	BS40	MXC	BS	50MXC	CS40NX	(	CS60N	X	CS60S	Т	BY30M	XC	BY40MXC	_
BY50MXC	CY30	MXCA	CY	40MXCA	BP30W	3	BP40W	'B	BP43W	/B	BP45W	В	BP50WB	
BP-50WS-C	BP-50	HS-A	BP	-85HS-A	BP-100H	IS-A	BP-120	HS-A	BP-140	HS-A	BP-100	HS-EI	BP-32WS-MY	(
BP-30WS-MX	BP30	MX	BP	35MX	BP40M>	(	BP45M	Х	BP50M	Х	BP30M	XC	BP40MXC	_
BP50MXC	BY30	HCST	BY	40HCST	BY50HC	ST	BY30H	СМ	BY40H	СМ	BY30H	СМТ	BY40HCMT	_
ES1100	ES15	00	ES	2200	ES3000		ES1100	A	ES1500	A	ES2200	A	ES3000A	
ES1100B	ES15	00B	ES	2200B	ES3000	в	ES1100	C	ES1500	)C	ES2200	C	ES3000C	_
ES1100D	ES15	00D	ES	2200D	ES3000	D	ES1100	)E	ES1500	)E	ES2200	)E	ES3000E	
		ES1100F		ES1500F		ES22	200F	ES30	DOF	CY50	MXCA			

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# **EMC -- TEST REPORT**

# Test Report No. : AOC250606102E

June 6, 2025 Date of issue

Test Model	: CY50MXCA
EUT	: HEAT PUMP
Applicant	: Cubic Electrical Appliance Co., Limited
Address	: Building 16-02, NO. 15 Shunye West Road, Xingtan Town, Shunde, Guangdong, China 528325
Telephone	:/
Fax	:/
Manufacturer	: Cubic Electrical Appliance Co., Limited
Address	: Building 16-02, NO. 15 Shunye West Road, Xingtan Town, Shunde, Guangdong, China 528325
Telephone	:/
Fax	:/
Factory	: Cubic Electrical Appliance Co., Limited
Address	: Building 16-02, NO. 15 Shunye West Road, Xingtan Town, Shunde, Guangdong, China 528325
Telephone	:/
Fax	:/

Test Result according to the standards on page 8:	Positive

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

# TABLE OF CONTENT

Test Report Description	Page
1. SUMMARY OF STANDARDS AND RESULTS	6
1.1.Description of Standards and Results	6
1.2.Description of Performance Criteria	7
2. GENERAL INFORMATION	8
2.1.Description of Device (EUT)	8
2.2.Test Facility	8
2.3.Statement of the Measurement Uncertainty	8
2.4.Measurement Uncertainty	9
3. MEASURING DEVICES AND TEST EQUIPMENT	10
4. TEST RESULTS	
4.1.Power Line Conducted Emission Measurement	
4.2. Clicks Measurement	
4.3. Disturbance Power Measurement	
4.4. Harmonic Current Emission Measurement	
4.5. Voltage Fluctuation And Flicker Measurement	20
4.6. Electrostatic Discharge Immunity Test	
4.7. Electrical Fast Transient/Burst Immunity Test	24 حد
4.0. Suge minuting rest	
4.10. Voltage Dips And Interruptions Test	33
MEASUREMENT	
5 1 Block Diagram of Test Setun	35
5.2.Measuring	
Standard	35
5.3.Radiated Emission Limits	35
5.4.EUT Configuration on Test	36
5.5.Operating Condition of EUT	
5.6.Test	
Procedure	
6. PHUIUGRAPHS OF IESI SEIUP	
7. EXTERNAL AND INTERNAL PHOTOS OF THE EUT	
8. MANUFACTURER/ APPROVAL HOLDERDECLARATION	48

This report shall not be reproduced except in full, without the written approval of Shenzhen AOCE Electronic Technology Service Co., Ltd. Page 5 of 46

# **1. SUMMARY OF STANDARDS AND RESULTS**

# 1.1.Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION (EN IEC 55014-1: 2021)						
Description of Test Item	Standard	Limits	Results			
Conducted disturbance at mains terminals	EN IEC 55014-1: 2021		PASS			
Clicks measurement	EN IEC 55014-1: 2021		PASS			
Disturbance Power	EN IEC 55014-1: 2021		PASS			
Radiated disturbance	EN IEC 55014-1: 2021		N/A			
Harmonic current emissions	EN IEC 61000-3-2: 2019+A1: 2021+A2: 2024	Class A	PASS			
Voltage fluctuations & flicker	EN 61000-3-3: 2013+A1: 2019+A2: 2021+AC: 2022		PASS			
імм	JNITY (EN IEC 55014-2: 2021)					
Description of Test Item	Basic Standard	Performance Criteria	Results			
Electrostatic discharge (ESD)	EN 61000-4-2: 2009	В	PASS			
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3: 2020	А	N/A			
Electrical fast transient (EFT)	EN 61000-4-4: 2012	В	PASS			
Surge (Input a.c. power ports)	EN 61000-4-5: 2014+A1: 2017	В	PASS			
Radio-frequency, Continuous conducted disturbance	EN 61000-4-6: 2014	А	PASS			
Power frequency magnetic field	EN 61000-4-8: 2010	А	N/A			
Voltage dips, 60% reduction		С	PASS			
Voltage dips, 30% reduction	EN 61000-4-11: 2020	С	PASS			
Voltage interruptions		С	PASS			
N/A is an abbreviation for Not Applicable.						

Test mode:		
Mode 1	Normal operation	Record

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# 1.2.Description of Performance Criteria

#### **General Performance Criteria**

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

- essential operational modes and states;

- tests of all peripheral access (hard disks, floppy disks, printers, keyboard, mouse, etc.);

- quality of software execution;
- quality of data display and transmission;
- quality of speech transmission.

#### 1.2.1.Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacture when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deliver from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### 1.2.2.Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacture, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operation state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be deliver from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### 1.2.3.Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacture's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be loss.

# 2. GENERAL INFORMATION

2.1.Description of Device (EUT)

EUT	: HEAT PUMP
Trade Mark	: N/A
Test Model	: CY50MXCA
Power Supply	: 230V, 50Hz, 1300W

2

# 2.2.Test Facility

EMC Lab.

# 2.3. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the AOCE quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

# 2.4.Measurement Uncertainty

Test	Parameters	Expanded uncertainty (Ulab)	Expanded uncertainty (Ucispr)
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	± 3.8 dB ± 3.4 dB
Power Disturbance	Level accuracy (30MHz to 300MHz)	± 2.90dB	± 4.5 dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	± 3.60 dB	± 3.3 dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.68 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	± 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	± 5.2 dB
Mains Harmonic	Voltage	± 0.510%	N/A
Voltage Fluctuations & Flicker	Voltage	± 0.510%	N/A
EMF		± 21.59%	N/A

(1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

(2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

# 3. MEASURING DEVICES AND TEST EQUIPMENT

3.1.0	3.1.Conducted Disturbance						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.		
1	EMI Test Software	AUDIX	E3	/	N/A		
2	EMI Test Receiver	R&S	ESPI	101840	2025/04/13		
3	Artificial Mains	R&S	ENV216	101288	2025/04/13		
4	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-003 2	2025/04/13		
3.2.C	3.2.Disturbance Power						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.		
1	EMI Test Software	AUDIX	E3	/	N/A		
2	EMI Test Receiver	R&S	ESPI	101840	2025/04/13		
3	Absorbing clamp	R&S	MDS 21	4033	2025/04/13		
4	6dB Attenuator	1	/	50FP-006-H3B	2025/04/13		
3.3.⊦	larmonic Current						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.		
1	Power Analyzer Test System	Voltech	PM6000	20000670053	2025/04/13		
3.4.∖	oltage fluctuation and	Flicker					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.		
1	Power Analyzer Test System	Voltech	PM6000	20000670053	2025/04/13		
3.5.E	electrostatic Discharge						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.		
1	ESD Simulator	SCHLODER	SESD 230	604035	2025/04/13		
3.6.E	electrical Fast Transier	nt/Burst					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.		
1	Immunity Simulative Generator	EM TEST	UCS500 M4	4 0101-34	2025/04/13		
3.7.5	Surge						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.		
1	Surge test system	EM test	UCS500 M4	4 0101-34	2025/04/13		
3.8.0	Conducted Susceptibili	ty					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.		
1	Simulator	FRANKONIA	CIT-10/75	A126A1195	2025/04/13		
2	CDN	FRANKONIA	CDN-M2+N 3	A2210177	2025/04/13		
3	6dB Attenuator	FRANKONIA	DAM25W	1172040	2025/04/13		

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Report No.: AOC250606102E

# 3.9.Voltage Dips

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.		
1 Voltage dips and up generator		3CTEST	VDG-1105G	EC0171014	2025/04/13		
3.10	3.10.Voltage Short Interruptions						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.		
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2025/04/13		

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Report No.: AOC250606102E

Shenzhen AOCE Electronic Technology Service Co., Ltd.

# 4. TEST RESULTS

- 4.1. Power Line Conducted Emission Measurement
- 4.1.1.Block Diagram of Test Setup



4.1.2. Power Line Conducted Emission Limits

Frequency	Limit (	dBµV)
(MHz)	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	59.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

Remark: \* means decreasing linearly with logarithm of frequency.

4.1.3.EUT Configuration on Test

The following equipments are installed on Conducted Emission Measurement to meet EN IEC 55014–1 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

# 4.1.4.Operating Condition of EUT

- 4.1.4.1.Setup the EUT as shown on Section 4.1.1.
- 4.1.4.2.Turn on the power of all equipments.
- 4.1.4.3.Let the EUT work in measuring Mode 1 and measure it.

#### 4.1.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through a Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN IEC 55014-1 regulations during conducted emission measurement.

The bandwidth of the field strength meter is set at 9kHz.

The frequency range from 150kHz to 30MHz is investigated. The scanning waveform please refer to the next page.

4.1.6.Test Results

#### PASS.

The frequency range 150kHz to 30MHz is investigated.



Report No.: AOC250606102E



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Report No.: AOC250606102E

# 4.2. Clicks Measurement

# 4.2.1.Block Diagram of Test Setup



## 4.2.2.Clicks Measurement Standard and limit

4.2.2.1.Test Standard EN IEC 55014-1: 2021

#### 4.2.2.2.Test Limit

According to standard EN IEC 55014-1, if click rate (N) less 5/min and the time of this discontinuous disturbances does not exceed 10ms, then the limit value are omitted.

## 4.2.3.EUT Configuration on Test

The configuration of EUT is same as Section 4.2.1.

# 4.2.4. Operating Condition of EUT

4.2.4.1.Setup the EUT as shown Section 4.2.1.

4.2.4.2.Turn on the power of all equipments.

4.2.4.3. After that, let EUT work in test Mode 1 and measure it.

# 4.2.5.Test Procedure

This test is done when switch operations in thermostatically controlled appliances, automatic program controlled machines and other electrically controlled or operated appliances may generate discontinuous disturbance (Click). The measurement of disturbance shall be performed at the following restricted number of frequencies: 150kHz, 500kHz, 1.4MHz and 30MHz. At each frequency, for appliances which stop automatically, duration of the minimum number of complete programs necessary to produce 40 counted clicks or, where relevant, 40 counted clicks have not been produced, the test is stopped at the end of the program in course. The relevant click rate N. The appliance under test shall be deemed to comply with the limit if not more than a quarter of the number of the counted click registered during the observation time.

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#### 4.2.6.Test Results

PASS.

The click rate (N=1/2.1=0.48<5) of the EUT is less than 5/min and the time of this discontinuous disturbances ( $\triangle$ T=4ms<10ms) does not exceed 10ms.According to EN IEC 55014-1, the limit values are omitted.

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# 4.3. Disturbance Power Measurement

# 4.3.1.Block Diagram of Test Setup



# 4.3.2.Test Standard

EN IEC 55014-1: 2021

# 4.3.3.Disturbance Power Limits

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

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

	Househo similar app	ld and pliances	Tools					
1	2	3	4	5	6	7	8	9
Frequen cy range			Rated motor power not exceeding 700 W		Rated motor power above 700 W and not exceeding 1000 W		Rated motor power above 1000 W	
(MHz)	dB (pW) Quasi-pea k	dB (pW) Average	dB (pW) Quasi-pea k	dB (pW) Averag e	dB (pW) Quasi-pea k	dB (pW) Averag e	dB (pW) Quasi-pe ak	dB (pW) Averag e
		Incre	easing linearly	with the fi	requency fron	า:		
200 to 300	200 to         0 to 10         -         0 to 10 dB         -         0 to 10 dB						-	
NOTE 1 This table only applies if specified in 4.1.2.3.2. NOTE 2 The measured result at a particular frequency shall be less than the relevant limit minus the corresponding margin (at that frequency).								

## 4.3.4.EUT Configuration on Test

The EN IEC 55014-1 Regulations test method must be used to find the maximum emission during radiated emission measurement. The configuration of the EUT is the same as used in conducted emission measurement.

## 4.3.5.Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 4.1.1 except the test set up replaced as Section 4.3.1.

#### 4.3.6.Test Procedure

The EUT is placed on the plane 0.8m high above the ground by insulating support 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 field strength meter is set at 120kHz. All the test results are listed in Section 4.3.7.

## 4.3.7.Test Results

#### PASS.

The frequency spectrum from 30 MHz to 300 MHz is investigated.



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# 4.4. Harmonic Current Emission Measurement

#### 4.4.1.Block Diagram of Test Setup



## 4.4.2.Test Standard

EN IEC 61000-3-2: 2019+A1: 2021+A2: 2024, Class A

#### 4.4.3.Operation Condition of EUT

Same as Section 4.1.4 except the test setup replaced as Section 4.4.1.

4.4.4.Test Results

PASS

# 4.5. Voltage Fluctuation And Flicker Measurement

# 4.5.1.Block Diagram of Test Setup



## 4.5.2.Test Standard

EN 61000-3-3: 2013+A1: 2019+A2: 2021+AC: 2022

# 4.5.3. Operation Condition of EUT

4.5.3.1.Setup the EUT as shown Section 4.5.1.

4.5.3.2. Turn on the power of all equipments.

4.5.3.3.Let EUT work in test mode (On/Off) and measure it.

#### 4.5.4.Test Results

PASS.

Test Model		CY50MXCA	Test Engineer	Andy
Overall Result: Notes:				
PASS	Measurement n	nethod - Voltage		
	-	4	11/1	
	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.089	0.009	0.137	0

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# 4.6. Electrostatic Discharge Immunity Test

# 4.6.1.Block Diagram of Test Setup



#### 4.6.2.Test Standard

EN IEC 55014-2: 2021(EN 61000-4-2: 2009, Severity Level: 3 / Air Discharge: ±8KV; Level: 2 / Contact Discharge: ±4KV)

## 4.6.3. Severity Levels and Performance Criterion

4	63	1	Severity	level
т.	.0.0		.OCVCIILY	10,001

	-	
Level	Test Voltage	Test Voltage
	Contact Discharge (KV)	Air Discharge (KV)
1.	±2	±2
2.	±4	±4
3.	±6	±8
4.	±8	±15
Х	Special	Special

4.6.3.2.Performance criterion: B

# 4.6.4.EUT Configuration on Test

The configuration of EUT are listed in Section 4.6.1.

# 4.6.5.Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 4.1.4, except the test set up replaced by Section 4.6.1.

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#### 4.6.6.Test Procedure

#### 4.6.6.1.Air Discharge

This test is done on a non-conductive surface. 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.

#### 4.6.6.2.Contact Discharge

All the procedure shall be same as Section 4.6.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

4.6.6.3. Indirect Discharge For Horizontal Coupling Plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

#### 4.6.6.4. Indirect Discharge For Vertical Coupling Plane

At least 10 single discharges (in the most sensitive polarity) 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.

4.6.7.Test Results

# PASS.

Please refer to the next page.

Report No.: AOC250606102E

Electrostatic Discharge Test Results						
Standard	□ IEC 61000-4-2	□ IEC 61000-4-2   ☑ EN 61000-4-2				
Applicant	Cubic Electrical Appliance Co., Limited					
EUT	HEAT PUMP Temperature 25°C					
M/N	CY50MXCA Humidity 50%					
Criterion	B Pressure 1021mbar					
Test Mode	Mode 1	Test Engineer	Andy			

Air Discharge							
		Test Leve	ls		Resu	lts	
Test Points	±2kV	±4kV	± 8kV	Passed	Fail	Perfor Criter	rmance ion
Front	$\square$	$\boxtimes$	$\square$				⊠B
Back	$\square$	$\boxtimes$	$\square$				⊠B
Left	$\square$	$\boxtimes$	$\square$				⊠B
Right	$\square$	$\boxtimes$	$\square$				⊠B
Тор	$\boxtimes$	$\boxtimes$	$\boxtimes$	$\square$			B
Bottom	$\square$	$\boxtimes$	$\boxtimes$	$\square$			⊠B
		Со	ntact Discha	irge			
		Test Leve	ls		Resul	ts	
Test Points	± 2 kV	,	±4 kV	Passed	Fail	Perfor Criter	rmance ion
Front	$\boxtimes$		$\boxtimes$				⊠B
Back	$\boxtimes$		$\boxtimes$				B
Left	$\square$		$\boxtimes$				⊠B
Right	$\square$		$\square$				B
Тор	$\boxtimes$		$\boxtimes$	$\square$			⊠B
Bottom	$\boxtimes$		$\boxtimes$	$\square$			B
		Discha	arge To Horiz	zontal Coup	oling Plane	)	
		Test Leve	ls	Results			
Side of EUT	± 2 kV	,	± 4 kV	Passed	Fail	Perfor Criter	rmance ion
Front	$\square$		$\boxtimes$			A	B
Back	$\square$		$\boxtimes$				B
Left	$\square$		$\boxtimes$				⊠B
Right	$\boxtimes$		$\boxtimes$				⊠B
	Dis	scharge T	o Vertical Co	oupling Pla	ne		
	Test Levels Results			lts			
Side of EUT	± 2 kV	,	± 4 kV	Passed	Fail	Perfor Criter	rmance ion
Front			$\square$				B
Back			$\boxtimes$			A	B
Left	$\square$		$\boxtimes$				B
Right	$\square$		$\boxtimes$				B

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# 4.7. Electrical Fast Transient/Burst Immunity Test

# 4.7.1.Block Diagram of Test Setup



## 4.7.2.Test Standard

EN IEC 55014-2: 2021 (EN 61000-4-4: 2012, Severity Level: Level 2: 1KV)

# 4.7.3. Severity Levels and Performance Criterion

4.7.3.1.Severity level

Open Circuit Output Test Voltage ± 10%						
Level	Level On Power Supply On I/O (Input/Output					
	Lines	Signal data and control				
lines						
1.	0.50KV	0.25KV				
2.	1.00KV	0.50KV				
3.	2.00KV	1.00KV				
4. 4.00KV 2.00KV						
X	Special	Special				

4.7.3.2.Performance criterion: B

# 4.7.4.EUT Configuration on Test

The configuration of EUT are listed in Section 4.7.1.

# 4.7.5. Operating Condition of EUT

4.7.5.1.Setup the EUT as shown in Section 4.7.1.

4.7.5.2. Turn on the power of all equipments.

4.7.5.3.Let the EUT work in test Mode 1 and measure it.

#### 4.7.6.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 EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

4.7.6.1. 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.

4.7.6.2. For signal lines and control lines ports:

No I/O ports. It's unnecessary to test.

4.7.6.3. For DC output line ports:

No DC output ports. It's unnecessary to test.

#### 4.7.7.Test Results

#### PASS.

Please refer to the following page.

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Shenzhen AOCE Electronic Technology Service Co., Ltd.

<b>Electrical F</b>	ast Transie	ent/Burst Te	est Results

Standard	□ IEC 61000-4-4 ☑ EN 61000-4-4				
Applicant	Cubic Electrical Appliance Co., Limited				
EUT	HEAT PUMP	Temperature	<b>25</b> ℃		
M/N	CY50MXCA	Humidity	50%		
Test Mode	Mode 1	Criterion	В		
Test Engineer	Andy				

Line	Test Voltage	Result (+)	Result (-)
L	1KV	PASS	PASS
N	1KV	PASS	PASS
PE			
L-N	1KV	PASS	PASS
L-PE			
N-PE			
L-N-PE			
Signal Line			
I/O Cable			

Note:

Report No.: AOC250606102E

Report No.: AOC250606102E

# 4.8. Surge Immunity Test

## 4.8.1.Block Diagram of Test Setup



#### 4.8.2.Test Standard

EN IEC 55014-2: 2021

(EN 61000-4-5: 2014+A1 : 2017, Severity Level: Level 2, Line to Line: 1.0KV; Level 3: Line to Ground: 2.0KV)

#### 4.8.3. Severity Levels and Performance Criterion

#### 4.8.3.1.Severity level

Severity Level	Open-Circuit Test Voltage
	(KV)
1	0.5
2	1.0
3	2.0
4	4.0
Х	Special

4.8.3.2.Performance criterion: B

#### 4.8.4.EUT Configuration on Test

The configuration of EUT are listed in Section 4.8.1.

# 4.8.5.Operating Condition of EUT

4.8.5.1. Setup the EUT as shown in Section 4.8.1.

4.8.5.2.Turn on the power of all equipments.

4.8.5.3.Let the EUT work in test Mode 1 and measure it.

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#### 4.8.6.Test Procedure

4.8.6.1.Set up the EUT and test generator as shown on Section 4.8.1.

4.8.6.2. For line to line coupling mode, provide a 1.0 KV 1.2/50us voltage surge

(at open-circuit condition) and 8/20us current surge to EUT selected points.

4.8.6.3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test

4.8.6.4.Different phase angles are done individually.

4.8.6.5.Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

## 4.8.7.Test Results

## PASS.

Please refer to the following pages

Report No.: AOC250606102E

	Surg	ie Immi	unity Te	est Result	
Standard	□ IEC 610	000-4-5 <b>⊠</b>	EN 61000-4	-5	
Applicant	Cubic Elect	rical Appliand	ce Co., Limite	d	
EUT	HEAT PUM	IP		Temperature	<b>25</b> ℃
M/N	CY50MXC	4		Humidity	50%
Test Mode	Mode 1			Criterion	В
Test Engineer	Andy				
Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (KV)	Result
	+	90°	5	1.0	PASS
	-	270°	5	1.0	PASS
L-N					
L-PE					
N-PE					
Signal Line					
Note		<u> </u>	1	1	1

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# 4.9. Injected Currents Susceptibility Test

# 4.9.1.Block Diagram of Test Setup



## 4.9.2.Test Standard

EN IEC 55014-2: 2021(EN 61000-4-6: 2014, Severity Level: 3V (rms), (0.15MHz ~ 230MHz))

## 4.9.3. Severity Levels and Performance Criterion

#### 4.9.3.1.Severity level

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

4.9.3.2.Performance criterion: A

#### 4.9.4.EUT Configuration on Test

The configuration of EUT are listed in Section 4.9.1.

#### 4.9.5. Operating Condition of EUT

4.9.5.1. Setup the EUT as shown in Section 4.9.1.

4.9.5.2. Turn on the power of all equipments.

4.9.5.3.Let the EUT work in test Mode 1 and measure it.

#### 4.9.6.Test Procedure

4.9.6.1.Set up the EUT, CDN and test generators as shown on Section 4.9.1.

4.9.6.2.Let the EUT work in test mode and measure it.

4.9.6.3.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).

4.9.6.4. The disturbance signal described below is injected to EUT through CDN.

4.9.6.5.The EUT operates within its operational mode(s) under intended climatic conditions after power on.

4.9.6.6.The frequency range is swept from 150kHz to 230MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.

4.9.6.7.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.

4.9.6.8.Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

4.9.7.Test Results

#### PASS.

Please refer to the following pages

Report No.: AOC250606102E

Injecte	d Currents Suscep	otibility Te	st Results
Standard	□ IEC 61000-4-6   ☑ EN 610	00-4-6	
Applicant	Cubic Electrical Appliance Co., L	imited	
EUT	HEAT PUMP	Temperature	<b>25</b> ℃
M/N	CY50MXCA	Humidity	50%
Test Mode	Mode 1	Criterion	А
Test Engineer	Andy		

Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 230	AC Mains	3V	А	PASS
Remark: 1. Modulation Sigr 2. Measurement E Simulator: C CDN : ☑	nal:1kHz 80% AN Equipment : IT-10 (FRANKOI ICDN-M2 (SWITZ CDN-M3 (SWITZ	/I NIA) ZERLAND EMTES ZERLAND EMTES	ST) ST)	
Note:				

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# 4.10. Voltage Dips And Interruptions Test

4.10.1.Block Diagram of Test Setup



## 4.10.2.Test Standard

EN IEC 55014-2: 2021 (EN 61000-4-11: 2020)

#### 4.10.3. Severity Levels and Performance Criterion

4.10.3.1.Severity level

Test Level (%U⊤)	Voltage dip and short interruptions (%U⊤)	Dura (in pe	ation eriod)
0	100	0.5	0.6
40	60	10	12
70	30	25	60

# 4.10.3.2.Performance criterion: C&C

# 4.10.4.EUT Configuration on Test

The configuration of EUT are listed in Section 4.10.1.

# 4.10.5. Operating Condition of EUT

4.10.5.1.Setup the EUT as shown in Section 4.10.1.

4.10.5.2.Turn on the power of all equipments.

4.10.5.3.Let the EUT work in test Mode 1 and measure it.

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#### 4.10.6.Test Procedure

4.10.6.1.Set up the EUT and test generator as shown on Section 4.10.1.

4.10.6.2. The interruptions is introduced at selected phase angles with specified duration.

4.10.6.3.Record any degradation of performance.

# 4.10.7.Test Results

PASS.

Please refer to the following page.

Report No.: AOC250606102E

Voltag	ge Dips And Interrupt	ions Tes	t Results
Standard	□ IEC 61000-4-11   ☑ EN 61000	-4-11	
Applicant	Cubic Electrical Appliance Co., Limite	ed	
EUT	HEAT PUMP	Temperature	<b>25</b> ℃
M/N	CY50MXCA	Humidity	50%
Test Mode	Mode 1	Criterion	C&C
Test Engineer	Andy		

Test Level	Voltage Dips & Short Interruptions	Duration (in periods)		Criterion	Result	
% U⊤	% U <sub>T</sub>	50Hz	60Hz			
40	60	10P	12P	С	PASS	
70	30	25P	60P	С	PASS	
0	100	0.5P	0.6P	С	PASS	

Note:

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# **5. RADIATED EMISSION MEASUREMENT**

# 5.1.Block Diagram of Test Setup



5.2.Measuring Standard EN IEC 55014-1:2017+A11:2020

5.3.Radiated Emission Limits

EN 55032: 2015 Limits:

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

FREQUENCY	DISTANCE	FIELD STRENGTHS LIMIT
(MHz)	(Meters)	(dBµV/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note:

1. The smaller limit shall apply at the combination point between two frequency bands.

2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

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#### 5.4.EUT Configuration on Test

The EN 55032 regulations test method must be used to find the maximum emission during radiated emission measurement.

# 5.5. Operating Condition of EUT

4.5.1 Turn on the power.

4.5.2 After that, let the EUT work in test mode (ON) and measure it.

#### 5.6.Test Procedure

The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. By-log antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the Receiver is set at 120kHz.

The frequency range from 30MHz to 1000MHz is investigated.

#### 5.7.Test Results

PASS.

The test result please refer to the next page.



Model No.		CY	50MXCA	4	Te	est Date	e		June 6, 2025	
Environmental Co	nditions	ditions 24°C/56% RH			Te	Test Mode		Charging		
Pol		Horizontal		D	Detector Function		Quasi-peak			
Test Engineer		An	ıdy		Di	stance			3m	
1	est Graph									-
	100 -			ENS	5014					
	90-									
	80-									
	70-									
								EN SERVICOD		
	p]leve							EN JOUTH-QF		
	30-					1				
	20-			Å	× Å.	Mr. Mr.	it is the sum	with the states	اشيما	
	10		man	mound her	wind What "	When when is	All Participation of the second s			
	0		10	DM	-				1G	
				Freque	ncy[Hz]					
	QP Lim     QP Dete	t — Horizon tlor	ntal PK							
Suc	- QP Lim • QP Dete	t — Horizor ctor	ntal PK							
Sus	- OP Lim • OP Dete	t — Horizor	ntal PK					1		
Sus	CP Limi CP Dete CP Dete CP Dete CP Dete CP Dete	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
Sus NO	- 0P Lim • 0P Det Dected List Freq. [MHz] 153.31331	Factor [dB] -16.23	Reading [dBµV/m] 37.82	Level [dBµV/m] 21.59	Limit [dBµV/m] 40.00	Margin [dB] 18.41	Height [cm]	Angle [°] 55	Polarity Horizontal	
Susj NO 1 2		Factor [dB] -16.23 -19.71	Reading [dBµV/m] 37.82 39.59	Level [dBµV/m] 21.59 19.88	Limit [dBµV/m] 40.00 40.00	Margin [dB] 18.41 20.12	Height [cm] 100 100	Angle [°] 55 37	Polarity Horizontal Horizontal	
Susj NO 1 2 3		Factor [dB] -16.23 -19.71 -18.24	Reading [dBµV/m] 37.82 39.59 41.95	Level [dBµV/m] 21.59 19.88 23.71	Limit [dBµV/m] 40.00 40.00 47.00	Margin [dB] 18.41 20.12 23.29	Height [cm] 100 100 100	Angle [°] 55 37 37	Polarity Horizontal Horizontal Horizontal	
Susj NO 1 2 3 4		Factor [dB] -16.23 -19.71 -18.24 -16.92	Reading [dBµV/m] 37.82 39.59 41.95 47.06	Level [dBµV/m] 21.59 19.88 23.71 30.14	Limit [dBµV/m] 40.00 40.00 47.00 47.00	Margin [dB] 18.41 20.12 23.29 16.86	Height [cm] 100 100 100 100	Angle [*] 55 37 37 249	Polarity Horizontal Horizontal Horizontal Horizontal	
Susj NO 1 2 3 4 5		Factor [dB] -16.23 -19.71 -18.24 -16.92 -15.68	Reading [dBµV/m] 37.82 39.59 41.95 47.06 39.27	Level [dBµV/m] 21.59 19.88 23.71 30.14 23.59	Limit [dBµV/m] 40.00 40.00 47.00 47.00 47.00	Margin [dB] 18.41 20.12 23.29 16.86 23.41	Height [cm] 100 100 100 100 100	Angle [*] 55 37 37 249 98	Polarity Horizontal Horizontal Horizontal Horizontal Horizontal	

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# 6. PHOTOGRAPHS OF TEST SETUP

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# 7. EXTERNAL AND INTERNAL PHOTOS OF THE EUT



Fig.1



Fig.2

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Fig.3



Fig.4

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Report No.: AOC250606102E



Fig.5



Fig.6

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Report No.: AOC250606102E



Fig.7



Fig.8

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Report No.: AOC250606102E



Fig.9



Fig.10

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Report No.: AOC250606102E



Fig.11



Fig.12

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Report No.: AOC250606102E



Fig.13

# -----THE END OF TEST REPORT------

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