VESYNC (SINGAPORE) PTE. LTD.

TEST REPORT

SCOPE OF WORK
EMC TESTING–REFER TO PAGE 2

REPORT NUMBER
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TEST REPORT

Applicant Name & Address	:	VESYNC (SINGAPORE) PTE. LTD. 6 Raffles Quay, #14-06, 048580 Singapore
Manufacturing Site	:	Zhejiang Biyi Electric Appliance Co., Ltd No.88, Yuzhaojiang Road, Chengdong Development Area, Yuyao, 315400, Zhejiang, China
Intertek Report No:		240306090GZU-001

Test standards

EN IEC 55014-1:2021
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A1:2019+A2:2021
EN IEC 55014-2:2021

Sample Description

Product	:	Air fryer
Model No.	:	CAF-TF101S-AUK, CAF-TF101S-AEUR, CAF-TF101S-AUKR, CAF-TF101S-AEU, CAF-TF101S-XXXX (where "X" may be blank, number from 0 to 9 or letter from A to Z)
Electrical Rating	:	AC 220-240V, 50 Hz CAF-TF101S-AEUR, CAF-TF101S-AEU, CAF-TF101S-XXXX (where "X" may be blank, number from 0 to 9 or letter from A to Z): 2800W CAF-TF101S-AUK, CAF-TF101S-AUKR: 2700 W
Serial No.		Not Labeled
Date Received	:	06 May 2024
Date Test Conducted	:	10 March 2024-10 April 2024

Prepared and Checked By

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Engineer

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1. TEST RESULTS SUMMARY

Test Item	Standard	Result
Continuous conducted disturbance voltage	EN IEC 55014-1:2021	Pass
Conducted Disturbance at wired network ports	EN IEC 55014-1:2021	N/A
Discontinuous conducted disturbance voltage	EN IEC 55014-1:2021	Pass
Radiated disturbance(9kHz-30MHz)	EN IEC 55014-1:2021	N/A
Radiated disturbance power	EN IEC 55014-1:2021	Pass
Radiated disturbance(30MHz-1000MHz)	EN IEC 55014-1:2021	N/A
Radiated disturbance above 1GHz	EN IEC 55014-1:2021	N/A
Harmonic of current	EN IEC 61000-3-2:2019+A1:2021	Pass
Flicker	EN 61000-3-3:2013+A1:2019+A2:2021	Pass
ESD immunity	EN IEC 55014-2: 2021 Reference: EN 61000-4-2:2009	Pass
Radiated EM field immunity	EN IEC 55014-2: 2021 Reference: EN 61000-4-3:2006+A1:2008+A2:2010	N/A
EFT immunity	EN IEC 55014-2: 2021 Reference: EN 61000-4-4:2012	Pass
Surge immunity	EN IEC 55014-2: 2021 Reference: EN 61000-4-5:2014+ A1:2017	Pass
Inject current immunity	EN IEC 55014-2: 2021 Reference: EN 61000-4-6:2014	Pass
Voltage dips and interruption immunity	EN IEC 55014-2: 2021 Reference: EN IEC 61000-4-11: 2020	Pass

Remark:

1. The symbol "N/A" in above table means Not Applicable.

2. When determining the test results, measurement uncertainty of tests has been considered.

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2. EMC RESULTS CONCLUSION

RE: EMC Testing Pursuant to Article 3.1(b) of the Radio Equipment Directive (2014/53/EU) Performed on the Air fryer,
Models: CAF-TF101S-AUK, CAF-TF101S-AEUR, CAF-TF101S-AUKR,CAF-TF101S-AEU, CAF-TF101S-XXXX
(where "X" may be blank, number from 0 to 9 or letter from A to Z).

CAF-TF101S-AEUR, CAF-TF101S-AEU, CAF-TF101S-XXXX (where "X" may be blank, number from 0 to 9 or letter from A to Z)
All models are the same except model name and appearance colour, different characters represent sales to different countries.

Model CAF-TF101S-AUK is identical to the CAF-TF101S-AEUR except for the rated power of upper heating element is 1300 W and rated power input is 2700W.
Models CAF-TF101S-AUK and CAF-TF101S-AUKR are identical except for the model name.

We tested the Air fryer, Model: CAF-TF101S-AEUR, to determine if it was in compliance with the relevant standards as marked on the Test Results Summary. We found that the unit met the requirements of EN IEC 55014-1, EN IEC 61000-3-2, EN 61000-3-3, EN IEC 55014-2 (EN 61000-4-2), EN IEC 55014-2 (EN 61000-4-4), EN IEC 55014-2 (EN 61000-4-6), EN IEC 55014-2 (EN 61000-4-5), & EN IEC 55014-2 (EN IEC 61000-4-11) standards when tested as received. The worst case's test data was presented in this test report.

The production units are required to conform to the initial sample as received when the units are placed on the market.

TEST REPORT

3. LABORATORY MEASUREMENTS

Configuration Information

Support Equipment:	N/A
Rated Voltage and frequency under test:	230 V~; 50 Hz
Condition of Environment:	Temperature: 22~28°C Relative Humidity:35~60% Atmosphere Pressure:86~106kPa

Notes:

1. The EMI measurements had been made in the operating mode produced the largest emission in the frequency band being investigated consistent with normal applications. An attempt had been made to maximize the emission by varying the configuration of the EUT.

2. The EMS measurements had been made in the frequency bands being investigated, with the EUT in the most susceptible operating mode consistent with normal applications. The configuration of the test sample had been varied to achieve maximum susceptibility.

3. Test Location:
Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
All tests were performed at:
Room101/301/401/102/202/302/402/502/602/702/802, No. 7-2, Caipin Road, Huangpu District, Guangzhou, Guangdong, China
Except Radiated Disturbance and Radiated Susceptibility were performed at:
Room102/104, No 203, KeZhu Road, Science City, GETDD Guangzhou, China

4. Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conducted Emission (9 kHz-150 kHz)	2.54 dB
2	Conducted Emission (150 kHz-30 MHz)	2.56 dB
3	Disturbance Power (30 MHz-300 MHz)	3.13 dB
4	Radiated Emission (9 kHz-30 MHz)	4.15 dB
5	Radiated Emission (30 MHz-1 GHz)	4.62 dB
6	Radiated Emission (1 GHz-6 GHz)	4.67 dB
7	Radiated Emission (6 GHz-18 GHz)	4.76 dB

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.
Measurement uncertainty is calculated in accordance with CISPR16-4-2:2011+A1:2014 +A2:2018.
The measurement uncertainty is given with a confidence of 95%, k=2.
Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

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4. EQUIPMENT USED DURING TEST

Conducted Disturbance-Mains Terminal (1)

Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EM080-05	EMI receiver	ESCI	R&S	1Y
EM006-05	LISN	ENV216	R&S	1Y
SA047-112	Digital Temperature-Humidity Recorder	RS210	YIJIE	1Y
EM004-04	EMC shield Room	8m×3m×3m	Zhongyu	1Y

Click (1)

Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EM008-02	Click Tester	DDA55	AFJ	1Y
EM006-06	LISN	ENV216	R&S	1Y
SA047-111	Digital Temperature-Humidity Recorder	RS210	YIJIE	1Y
EM004-03	EMC shield Room	8m×4m×3m	Zhongyu	1Y

Disturbance Power

Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EM080-05	EMI receiver	ESCI	R&S	1Y
EM081-04	Absorb Power Clamp	MDS-21	R&S	1Y
SA047-112	Digital Temperature-Humidity Recorder	RS210	YIJIE	1Y
EM004-04	EMC shield Room	8m×3m×3m	Zhongyu	1Y

Harmonic Currents and Flicker (2)

Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EM001-03	3-Phase Harmonic & Flicker Measuring System	Profline2145-400	TESEQ	1Y
EM001-03-01	AC Power Source	NSG1007	TESEQ	1Y
SA047-102	Digital Temperature-Humidity Recorder	RS210	YIJIE	1Y

Electrostatic Discharge (1)

Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EM077-04	ESD Simulator	NSG437	TESEQ	1Y
SA047-176	Digital Temperature-Humidity Recorder	RS210	YIJIE	1Y

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Electrical Fast Transient/Burst (1)

Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EM005-12	EFT Generator	NX5 b-1-300-16	EM TEST	1Y
EM005-10-01	Capacitive Coupling Clamp	CDN8014	TESEQ	1Y
SA047-102	Digital Temperature-Humidity Recorder	RS210	YIJIE	1Y

Surge (3)

Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EM005-09	Surge/DIP Generator	NSG3040	TESEQ	1Y
SA047-102	Digital Temperature-Humidity Recorder	RS210	YIJIE	1Y

Conducted Susceptibility (2)

Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EM019-01	Conducted Immunity Testing System	NSG4070-75	Teseq GmbH	1Y
EM019-01-01	Current Electromagnetic injection clamp	KEMZ801S	Teseq GmbH	1Y
EM019-01-02	Coupling&Decoupling Network	CDNM016	Teseq GmbH	1Y
EM019-01-03	6dB Attenuator	ATN6075	Teseq GmbH	1Y
EM019-03	Current Clamp	CIP 9136A	Teseq GmbH	1Y
SA047-102	Digital Temperature-Humidity Recorder	RS210	YIJIE	1Y

Voltage Dips and Interruptions (2)

Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EM005-09	Surge/DIP Generator	NSG3040	TESEQ	1Y
EM005-09-01	Voltage Regulator	INA6501	TESEQ	1Y
SA047-102	Digital Temperature-Humidity Recorder	RS210	YIJIE	1Y

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Detail of the equipment calibration due date:

Equipment No.	Cal. Due date (DD-MM-YYYY)
Conducted Disturbance-Mains Terminal (1)	
EM080-05	06/06/2024
EM006-05	06/06/2024
SA047-112	22/10/2024
EM004-04	03/01/2025
Conducted Disturbance-Mains Terminal (2)	
EM031-04	04/01/2025
EM006-06	04/09/2024
SA047-111	22/10/2024
EM004-03	03/01/2025
EM031-04-01	N/A
Conducted Disturbance-Load and Control Terminal (1)	
EM080-05	06/06/2024
EM080-05-01	04/09/2024
SA047-112	22/10/2024
EM004-04	03/01/2025
Conducted Disturbance-Load and Control Terminal (2)	
EM080-05	06/06/2024
EM005-06-01	04/09/2024
SA047-112	22/10/2024
EM004-04	03/01/2025
Conducted Disturbance-Telecom Terminal	
EM080-05	06/06/2024
EM011-05	09/04/2025
EM011-06	09/04/2025
EM006-06	04/09/2024
SA047-112	22/10/2024
EM004-04	03/01/2025
Conducted Disturbance-Antenna Terminal	
EM031-04	04/01/2025
EM084-02	19/07/2024
EM041-01	15/01/2025
EM041-02	15/01/2025
SA047-111	22/10/2024
EM004-03	03/01/2025
Click (1)	
EM008-02	15/11/2024
EM006-06	04/09/2024
SA047-111	22/10/2024
EM004-03	03/01/2025
Click (2)	
EM008-02	15/11/2024
EM008-02-01	15/11/2024
EM032-02	13/07/2024
SA047-111	22/10/2024
EM004-03	03/01/2025
Disturbance Power	
EM080-05	06/06/2024
EM081-04	26/02/2025
SA047-112	22/10/2024
EM004-04	03/01/2025

Equipment No.	Cal. Due date (DD-MM-YYYY)
Radiated Disturbance (CDN Method)	
EM080-05	06/06/2024
EM003-02	12/11/2024
EM003-03	12/11/2024
EM046-04-03	03/03/2025
EM032-02-01	13/07/2024
EM032-02-02	13/07/2024
SA047-112	22/10/2024
EM004-04	03/01/2025
Radiated electromagnetic disturbances (9 kHz-30 MHz)	
EM031-04	04/01/2025
EM061-04	03/03/2025
SA047-111	22/10/2024
EM004-03	03/01/2025
Radiated Disturbance (9 kHz-30 MHz)	
EM030-04	09/04/2025
EM031-02	15/11/2024
EM011-04	02/07/2024
EM031-02-01	09/04/2025
SA047-118	16/07/2024
EM045-01-01	N/A
Radiated Disturbance (30 MHz-1 GHz)	
EM030-04	09/04/2025
EM031-02	15/11/2024
EM033-01	05/12/2024
EM031-02-01	09/04/2025
EM036-01	17/07/2024
SA047-118	16/07/2024
EM045-01-01	N/A
Radiated Disturbance (1-18 GHz)	
EM030-04	09/04/2025
EM031-02	15/11/2024
EM031-03	12/11/2024
EM033-02	02/07/2024
EM033-02-02	09/04/2025
EM022-03	15/05/2025
SA047-118	16/07/2024
EM045-01-01	N/A
Harmonic Currents and Flicker (1)	
EM001-02	12/11/2024
SA047-111	22/10/2024
Harmonic Currents and Flicker (2)	
EM001-03	04/09/2024
EM001-03-01	04/09/2024
SA047-102	16/07/2024
EMF	
EM007-03	10/03/2025
SA047-112	22/10/2024
Induced Current Density (20 kHz-10 MHz)	
EM031-04	04/01/2025
EM007-02	08/01/2025
SA047-111	22/10/2024

Equipment No.	Cal. Due date (DD-MM-YYYY)
Electrostatic Discharge (1)	
EM077-04	20/08/2024
SA047-176	04/01/2025
Electrostatic Discharge (2)	
EM077-02	06/06/2024
SA047-176	04/01/2025
Electrical Fast Transient/Burst (1)	
EM005-12	09/04/2025
EM005-10-01	09/04/2025
SA047-102	16/07/2024
Electrical Fast Transient/Burst (2)	
EM005-10	08/05/2025
EM005-10-01	09/04/2025
SA047-102	16/07/2024
Surge (2)	
EM005-08	13/07/2024
SA047-102	16/07/2024
Surge (3)	
EM005-09	06/06/2024
SA047-102	16/07/2024
Conducted Susceptibility (1)	
EM046-04	07/12/2024
EM084-02	17/03/2025
EM003-01-04	04/09/2024
EM046-04-03	03/03/2025
EM003-02	12/11/2024
EM003-03	12/11/2024
EM019-01-06	14/03/2025
EM019-01-01	04/09/2024
EM019-03	13/07/2024
SA047-102	16/07/2024
Conducted Susceptibility (2)	
EM019-01	09/04/2025
EM019-01-01	04/09/2024
EM019-01-02	04/09/2024
EM019-01-03	04/09/2024
EM019-03	13/07/2024
SA047-102	16/07/2024
Voltage Dips and Interruptions (2)	
EM005-09	06/06/2024
EM005-09-01	06/06/2024
SA047-102	16/07/2024
Radiated Susceptibility	
EM030-04	09/04/2025
EM031-01	17/03/2025
EM086-11	12/11/2024
EM086-11-01	12/11/2024
EM046-01	03/03/2025
EM046-03	04/09/2024
EM061-05	09/10/2025
EM061-07	09/10/2025
EM034-01	/
EM045-01-01	/
SA047-118	16/07/2024
Power Frequency Magnetic Field	
EM001-03	04/09/2024
EM001-03-02	04/09/2024
SA047-102	16/07/2024
Ring Wave	
EM005-11	09/04/2025
SA047-102	16/07/2024

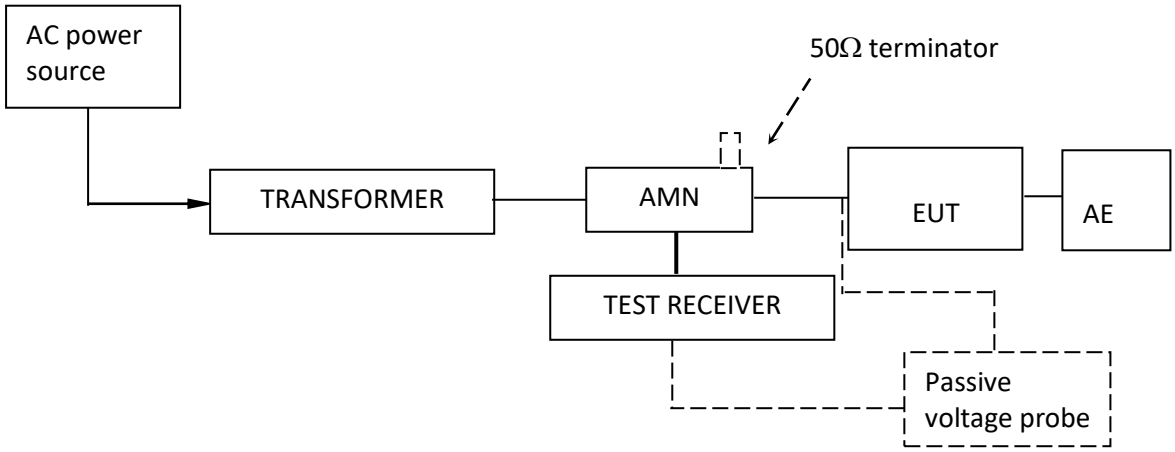
TEST REPORT

5. EMI TEST

5.1 EN IEC 55014-1 Continuous Conducted Disturbance Voltage Test

Test Result: Pass

5.1.1 Block Diagram of Test Setup



5.1.2 Test Setup and Procedure

The EUT was set to achieve the maximum emission level. The mains terminal disturbance voltage was measured with the EUT in a shielded room. The EUT was connected to AC power source through an Artificial Mains Network which provides a 50Ω linear impedance Artificial hand is used if appropriate (for handheld apparatus). The load/control terminal disturbance voltage was measured with passive voltage probe if appropriate.

The table-top EUT was placed on a 0.8m high non-metallic table above earthed ground plane(Ground Reference Plane).And for floor standing EUT, was placed on a 0.1m high non-metallic supported on GRP. The EUT keeps a distance of at least 0.4m from any other of the metallic surface. The Artificial Mains Network is situated at a distance of 0.8m from the EUT.

During the test, mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m.

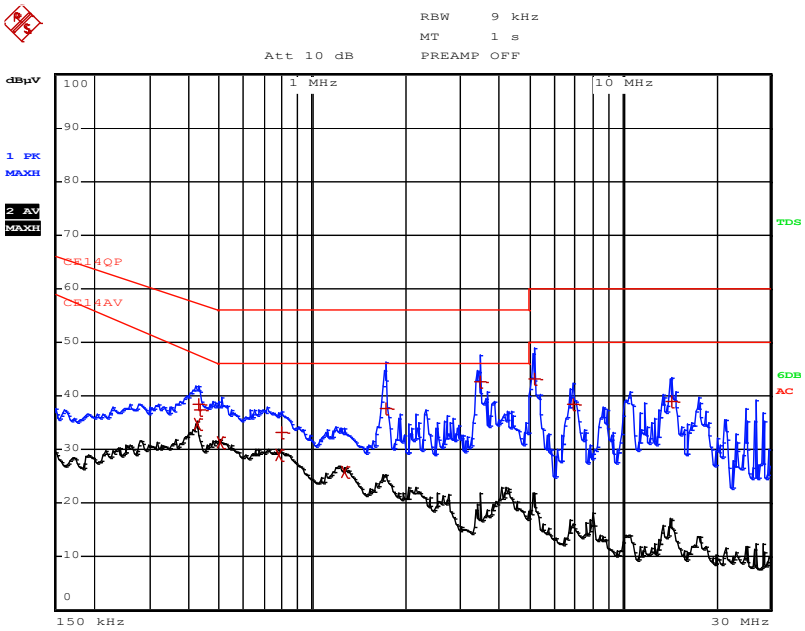
The bandwidth of test receiver was set at 9 kHz. The frequency range from 150 kHz to 30MHz was checked.

When measurements of disturbance are being made, the appliance shall be operated under the conditions defined in Annex A.

TEST REPORT

5.1.3 Test Data and curve

At mains terminal:
Tested Wire: Live **Operation Mode: heating**



EDIT PEAK LIST (Final Measurement Results)

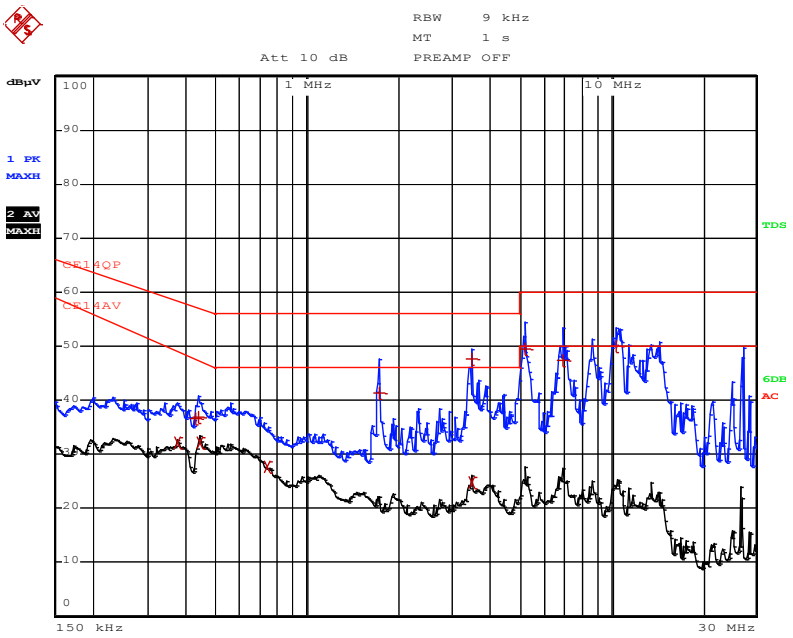
Trace1: CE14QP
Trace2: CE14AV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
2	CISPR Average	422 kHz	34.90	L1	-12.92
1	Quasi Peak	430 kHz	38.38	L1	-18.87
1	Quasi Peak	434 kHz	37.51	L1	-19.65
2	CISPR Average	502 kHz	31.39	L1	-14.60
2	CISPR Average	778 kHz	28.91	L1	-17.08
1	Quasi Peak	794 kHz	33.32	L1	-22.67
2	CISPR Average	1.266 MHz	25.94	L1	-20.05
1	Quasi Peak	1.738 MHz	37.64	L1	-18.35
1	Quasi Peak	3.478 MHz	42.67	L1	-13.32
1	Quasi Peak	5.214 MHz	43.21	L1	-16.78
1	Quasi Peak	6.962 MHz	38.49	L1	-21.50
1	Quasi Peak	14.474 MHz	39.04	L1	-20.95

Remark:
1. Corr. (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Level (dBµV) = Corr. (dB) + Read Level (dBµV)
3. Delta Limit (dB) = Level (dBµV)-Limit (dBµV)

TEST REPORT

Tested Wire: Neutral **Operation Mode: heating**



EDIT PEAK LIST (Final Measurement Results)

Trace1: CE14QP
Trace2: CE14AV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
2	CISPR Average	374 kHz	32.14	L1	-16.98
1	Quasi Peak	430 kHz	36.68	L1	-20.56
1	Quasi Peak	438 kHz	36.84	L1	-20.25
2	CISPR Average	442 kHz	32.13	L1	-15.19
2	CISPR Average	742 kHz	27.60	L1	-18.39
1	Quasi Peak	1.726 MHz	41.46	L1	-14.53
1	Quasi Peak	3.474 MHz	47.64	L1	-8.35
2	CISPR Average	3.478 MHz	24.68	L1	-21.31
1	Quasi Peak	5.218 MHz	49.45	L1	-10.54
1	Quasi Peak	6.954 MHz	47.41	L1	-12.58
1	Quasi Peak	10.422 MHz	50.10	L1	-9.89

Remark:
1. Corr. (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Level (dBµV) = Corr. (dB) + Read Level (dBµV)
3. Delta Limit (dB) = Level (dBµV)-Limit (dBµV)

At load/control terminal:

Not Applicable.

TEST REPORT

5.2 EN IEC 55014-1 Conducted Common Mode (Asymmetric Mode) Disturbance at wired network Ports

Test Result: Not Applicable

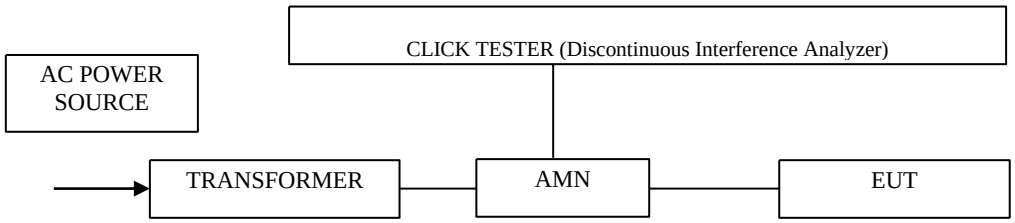
Remark: The test only apply to balanced unscreened ports intended for connection to unscreened balanced pairs

TEST REPORT

5.3 EN IEC 55014-1 Discontinuous Conducted Disturbance Voltage

Test Result: Pass

5.3.1 Block Diagram of Test Setup



5.3.2 Test Setup and Procedure

The EUT was placed on a 0.8m high non-metallic table in shielded room, the wall of shielded room used as Ground Reference Plane (GRP), and keeps a distance of at least 0.8m from any of the other metallic surface.
The EUT was connected to an artificial mains network and at a distance of 0.8m from it, the excess lead of EUT was bundled with a length of 0.3m to 0.4m parallel to the main lead.
The number of counted clicks above the permitted limit for continuous interference and their duration, spacing and rate were measured during the observation time. When relevant, a permitted(relaxed) limit for clicks was calculated and a second measurement was performed. Determination of compliance with the permitted limit according to the upper quartile method was applied. The frequency 150kHz, 500 kHz, 1.4 MHz and 30 MHz was checked.

When measurements of disturbance are being made, the appliance shall be operated under the conditions defined in Annex A.

TEST REPORT

5.3.3 Test Data and curve

Test mode: heating

Frequency (MHz)	0.15	0.50	1.40	30.00
Permitted limit for continuous interference (dBμV)	66	56	56	60
Short Clicks [T<10ms]	26	40	2	0
Mid. Clicks [10ms<T<20ms]	0	0	0	0
Long Clicks [T>20ms]	0	0	0	0
Total clicks (number)	26	40	2	0
Switching operation (number)	--			
Factor	--			
Observation time (min.)	5			
Click rate, N	5.28	8.12	0.41	0.00
Value to be added (dB)	--	--	--	--
Counted clicks allowed to exceed the permitted limit (number)	--	--	--	--
Permitted limit for clicks (dBμV)	--	--	--	--
Counted clicks exceeding the limit (number)	--	--	--	--
Complies with the limit (Pass/Fail)	Pass	Pass	Pass	Pass

The appliance was deemed to comply with the limits if fulfilling the three conditions below:
– the click rate is not more than 5.
– none of the caused clicks has a duration longer than 20 ms.
– 90 % of the caused clicks have a duration less than 10 ms.

second test run:

Permitted limit for clicks (dBμV)	81.09	67.35	--	--
Counted clicks exceeding the limit (number)	6	10	--	--
Complies with the limit (Pass/Fail)	Pass	Pass	Pass	Pass

TEST REPORT

5.4 EN IEC 55014-1 Radiated Disturbance (9 kHz-30 MHz)- Magnetic field induced current method

Test Result: Not Applicable
Remark: The test only applies to induction cooking appliances.

5.5 EN IEC 55014-1 Radiated Disturbance (9 kHz-30 MHz)- Magnetic field strength method

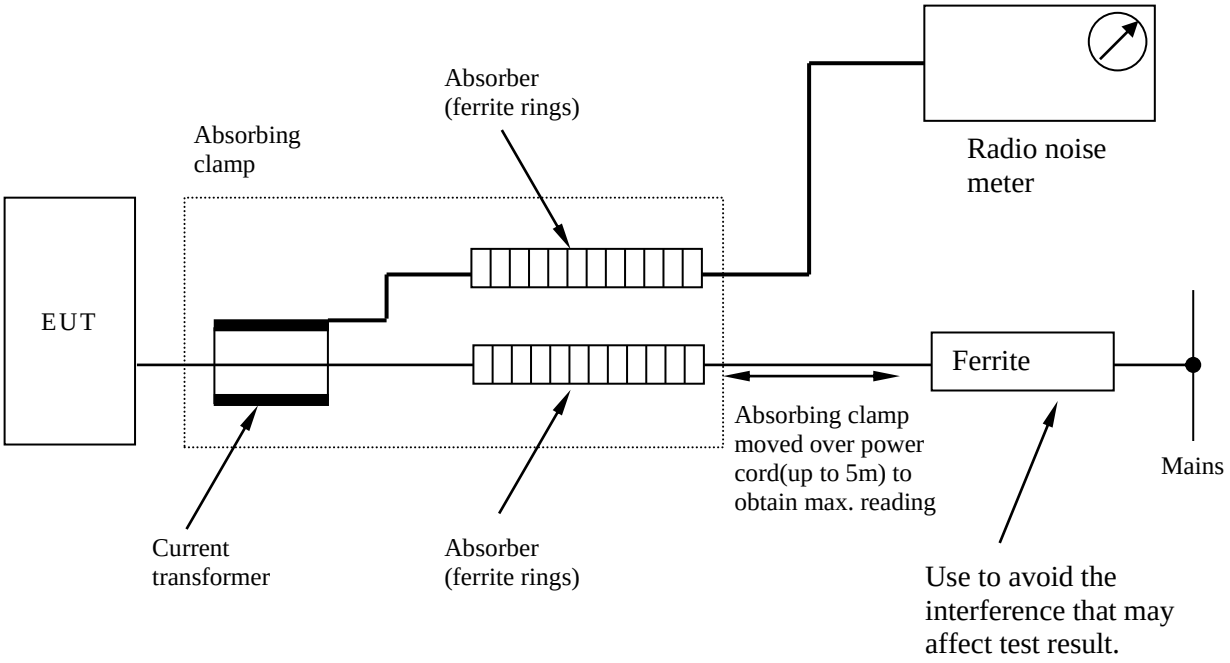
Test Result: Not Applicable
Remark: The test only applies to induction cooking appliances.

TEST REPORT

5.6 EN IEC 55014-1 Radiated Disturbance Power

Test Result: Pass

5.6.1 Block Diagram of Test Setup



Note: ——— : power line

——— : signal lime

5.6.2 Test Setup and Procedure

The disturbance power was measured with the EUT in a shielded room. The height of the table shall be 0.12 m for appliances primarily intended to be positioned on the floor in normal use, and 0.8 m for other appliances. The EUT was placed on a non-metallic table at least 0.8m from other metallic surface and the mains lead of EUT was extended to about 6m long. The auxiliary lead longer than 0.25m but shorter than twice length of absorbing clamp was extend to twice length of clamp and those longer than twice length was extend to 6 meters.

The absorbing clamp was moved along the lead to obtain maximum disturbance. The EUT was set to achieve the maximum emission level, and for each point which appears a relevant high emission level, the absorbing clamp was moved around the lead to get the maximum disturbance value.

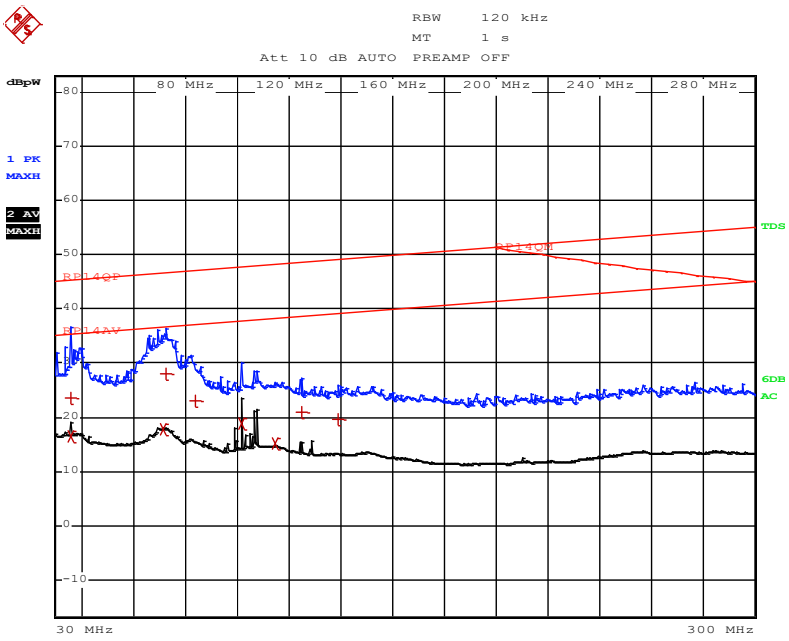
The bandwidth of test receiver was set at 120 kHz. The frequency range from 30MHz to 300MHz was checked.

When measurements of disturbance are being made, the appliance shall be operated under the conditions defined in Annex A.

TEST REPORT

5.6.3 Test Data and curve

Test port: Mains **Operation Mode: heating**



EDIT PEAK LIST (Final Measurement Results)

Trace1: RP14QP
Trace2: RP14AV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBpW		DELTA LIMIT dB
1	Quasi Peak	36 MHz	23.59	L1	-21.62
2	CISPR Average	36 MHz	16.42	L1	-18.80
2	CISPR Average	71.56 MHz	17.70	L1	-18.83
1	Quasi Peak	72.84 MHz	27.98	L1	-18.60
1	Quasi Peak	84.04 MHz	23.04	L1	-23.96
2	CISPR Average	101.72 MHz	18.69	L1	-18.96
2	CISPR Average	114.6 MHz	15.09	L1	-23.03
1	Quasi Peak	124.84 MHz	20.98	L1	-27.52
1	Quasi Peak	139.04 MHz	19.58	L1	-29.44

The measurement quasi-peak data of disturbance power is lower than applicable limit reduced by the margin (0 to 10dB) at frequency range 200 to 300 MHz and the maximum clock frequency is less than 30MHz

TEST REPORT

5.7 EN IEC 55014-1 Radiated Disturbance(30MHz-1000MHz)

Test Result: Not Applicable

Remark:

☒ Radiated disturbance shall not be conducted, if the measurement quasi-peak data of disturbance power is lower than applicable limit reduced by the margin (0 to 10dB) at frequency range 200 to 300 MHz and the maximum clock frequency is less than 30MHz,.

5.8 EN IEC 55014-1 Radiated Emission above 1 GHz

Test Result: Not Applicable

Remark:

Required highest frequency for radiated electric field strength measurements

Highest clock frequency (Fx)	Highest measurement frequency
*F*x ≤ 108 MHz	1 GHz
108 MHz < *F*x ≤ 500 MHz	2 GHz
500 MHz < *F*x ≤ 1 GHz	5 GHz
*F*x > 1 GHz	5 × Fx up to a maximum of 6 GHz

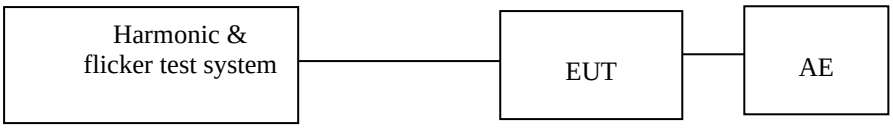
The Highest clock frequency (*F*x) of the EUT is not more than 108 MHz, so the measurement above 1000 MHz is not applicable.

TEST REPORT

6. Harmonics of current

Test Result: Pass

6.1 Block Diagram of Test Setup



6.2 Test Setup and Procedure

Harmonics of the fundamental current were measured up to 40 order harmonics using a digital power meter with an analogue output and frequency analyser which was integrated in the harmonic & flicker test system. The measurements were carried out under steady conditions.

TEST REPORT

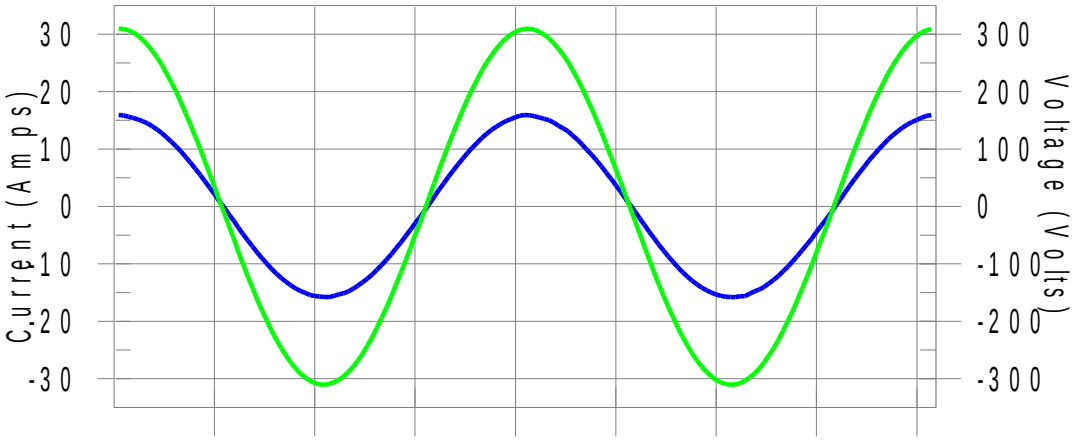
6.3 Test Data

Harmonics – Class-A per Ed. 5.0 (2018)(Run time) incl. inter-harmonics

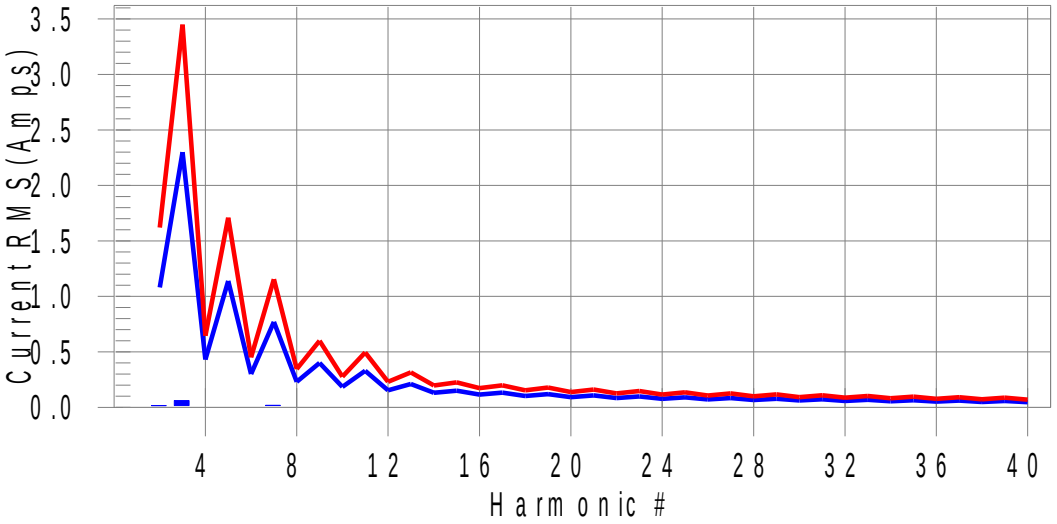
Test mode: heating

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonics H38-11.0% of 150% limit, H38-12.5% of 100% limit.

TEST REPORT

Current Test Result Summary (Run time)

Test Result: Pass **Source qualification: Normal**
THC(A): 0.074 **I-THD(%): 0.7** **POHC(A): 0.008** **POHC Limit(A): 0.251**

Highest parameter values during test:

V_RMS (Volts):	**219.828**	**Frequency(Hz):**	**60.00**
I_Peak (Amps):	**16.047**	**I_RMS (Amps):**	**11.196**
I_Fund (Amps):	**11.196**	**Crest Factor:**	**3.632**
Power (Watts):	**2453.9**	**Power Factor:**	**1.000**

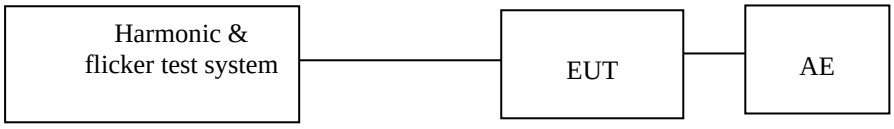
Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.017	1.080	1.5	0.154	1.620	9.5	Pass
3	0.061	2.300	2.7	0.097	3.450	2.8	Pass
4	0.011	0.430	2.5	0.046	0.645	7.2	Pass
5	0.005	1.140	N/A	0.033	1.710	N/A	Pass
6	0.014	0.300	4.6	0.033	0.450	7.4	Pass
7	0.018	0.770	2.3	0.030	1.155	2.6	Pass
8	0.007	0.230	3.1	0.024	0.345	6.8	Pass
9	0.007	0.400	1.7	0.022	0.600	3.6	Pass
10	0.011	0.184	6.0	0.021	0.276	7.7	Pass
11	0.012	0.330	3.7	0.020	0.495	4.0	Pass
12	0.004	0.153	N/A	0.016	0.230	N/A	Pass
13	0.005	0.210	N/A	0.016	0.315	N/A	Pass
14	0.009	0.131	6.5	0.015	0.197	7.5	Pass
15	0.007	0.150	4.7	0.013	0.225	5.9	Pass
16	0.004	0.115	N/A	0.012	0.173	N/A	Pass
17	0.004	0.132	N/A	0.012	0.198	N/A	Pass
18	0.005	0.102	5.2	0.012	0.153	7.6	Pass
19	0.005	0.118	N/A	0.011	0.178	N/A	Pass
20	0.004	0.092	N/A	0.011	0.138	N/A	Pass
21	0.003	0.107	N/A	0.009	0.161	N/A	Pass
22	0.003	0.084	N/A	0.009	0.125	N/A	Pass
23	0.003	0.098	N/A	0.008	0.147	N/A	Pass
24	0.003	0.077	N/A	0.008	0.115	N/A	Pass
25	0.003	0.090	N/A	0.008	0.135	N/A	Pass
26	0.003	0.071	N/A	0.007	0.107	N/A	Pass
27	0.002	0.083	N/A	0.007	0.125	N/A	Pass
28	0.003	0.066	N/A	0.007	0.099	N/A	Pass
29	0.003	0.078	N/A	0.007	0.116	N/A	Pass
30	0.003	0.061	N/A	0.006	0.092	N/A	Pass
31	0.003	0.073	N/A	0.006	0.109	N/A	Pass
32	0.003	0.058	N/A	0.006	0.086	N/A	Pass
33	0.003	0.068	N/A	0.006	0.102	N/A	Pass
34	0.002	0.054	N/A	0.006	0.081	N/A	Pass
35	0.003	0.064	N/A	0.006	0.096	N/A	Pass
36	0.003	0.051	N/A	0.006	0.077	N/A	Pass
37	0.002	0.061	N/A	0.005	0.091	N/A	Pass
38	0.006	0.048	12.5	0.008	0.073	11.0	Pass
39	0.003	0.058	N/A	0.005	0.087	N/A	Pass
40	0.002	0.046	N/A	0.004	0.069	N/A	Pass

TEST REPORT

7. Flicker

Test Result: Pass

7.1 Block Diagram of Test Setup



7.2 Test Setup and Procedure

7.2.1 Definition

Flicker:	impression of unsteadiness of visual sensation induced by a lighting stimulus whose luminance or spectral distribution fluctuates with time.
Pst:	Short-term flicker indicator The flicker severity evaluated over a short period (in minutes); Pst=1 is the conventional threshold of irritability
Plt:	long-term flicker indicator; the flicker severity evaluated over a long period (a few hous). Using successive Pst valuse.
dc:	the relative steady-state voltage change
dmax:	the maximum relative voltage change
d(t):	the value during a voltage change

7.2.2 Test condition

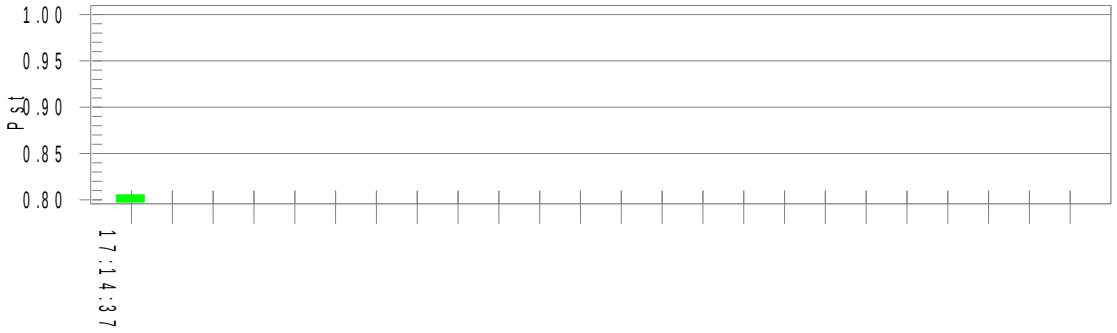
The EUT was set to produce the most unfavourable sequence of voltage changes.

TEST REPORT

7.3 Test Data

Flicker Test Summary (Run time)

Pst_i and limit line **European Limits**



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**215.14**			
T-max (mS):	**0.0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**2.19**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**2.25**	**Test limit (%):**	**6.00**	**Pass**
Highest Pst (10 min. period):	**0.805**	**Test limit:**	**1.000**	**Pass**

TEST REPORT

8. EMS TEST

Performance Criteria:

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 (or permission loss of performance) 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.

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 (or permission loss of performance) 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. 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.

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 instruction for use.

Operation mode of EMS test:

Test Item	Operation mode
ESD immunity	heating
Radiated EM field immunity	N/A
EFT immunity	heating
Surge immunity	heating
Inject current immunity	heating
Voltage dips and interruption immunity	heating

Note: "N/A" means Not Applicable in below text.

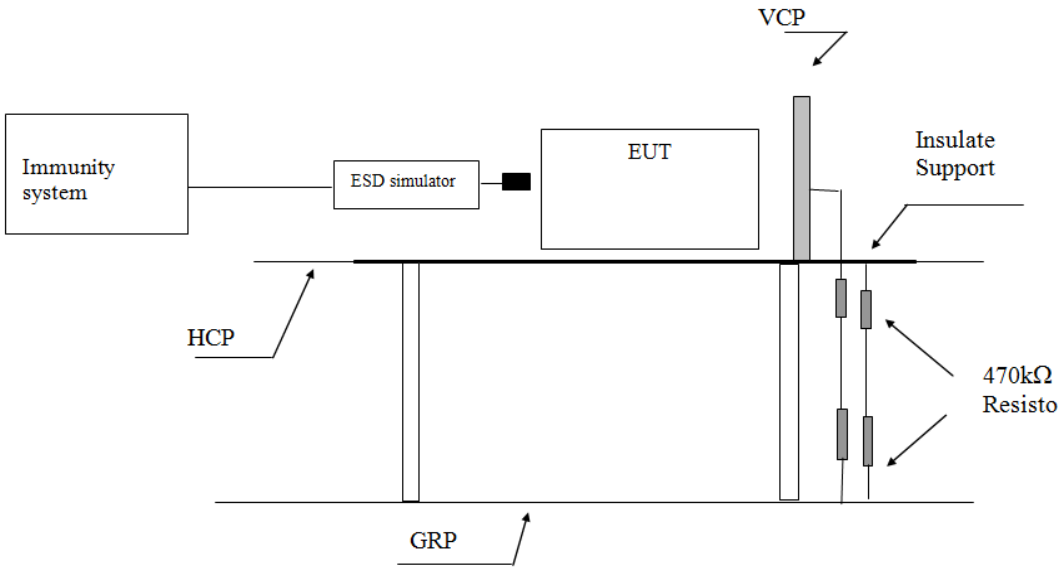
TEST REPORT

8.1 EN 61000-4-2(Pursuant to EN IEC 55014-2) Electrostatic Discharge Immunity

Performance criterion: B

Test Result: Pass

8.1.1 Block Diagram of Test Setup



Note: HCP means Horizontal Coupling Plane,

VCP means Vertical Coupling Plane

GRP means Ground Reference Plane

8.1.2 Test Setup and Procedure

The EUT was put on a 0.8m high wooden table 0.1m high for floor standing equipment standing on the ground reference plane (GRP) 3m by 2m in size, made by iron 1.0 mm thick.

A horizontal coupling plane(HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size & HCP were constructed from the same material type & thickness as that of the GRP, and connected to the GRP via a 470kΩ resistor at each end.

The distance between EUT and any of the other metallic surface excepted the GRP, HCP & VCP was greater than 1m.

The EUT was arranged and connected according to its functional requirements.

Direct static electricity discharges were applied only to those points and surface which were accessible to personnel during normal usage.

TEST REPORT

On each preselected points 10 times of each polarity single discharge were applied. The time interval between successive single discharges was at least 1s.

The ESD generator was held perpendicular to the surface to which the discharge was applied. The discharge return cable of the generator was kept at a distance of 0.2m whilst the discharge was being applied. During the contact discharges, the tip of the discharge electrode was touched the EUT before the discharge switch was operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT.

Indirect discharge was conducted to objects placed near the EUT, simulated by applying the discharges of the ESD generator to a coupling plane, in the contact discharge mode.

After each discharge, the ESD generator was removed from the EUT, the generator was then retriggered for a new single discharge. For ungrounded product, a grounded carbon fibre brush with bleeder resistors (2×470 kΩ) in the grounding cable was used after each discharge to remove remnant electrostatic voltage.

For air discharge, a minimum of 10 single air discharges were applied to the selected test point for each such area.

TEST REPORT

8.1.3 Test Result

Direct Application of ESD

Direct Contact Discharge

Applied Voltage (kV)	No. of Discharge for each point	Result (Pursuant to EN IEC 55014-2)	Discharged Points
4	20	N/A	Accessible metal parts of the EUT Conductive substrate with coating which is not declared to be insulating

Direct Air Discharge

Applied Voltage (kV)	No. of Discharge for each point	Result (Pursuant to EN IEC 55014-2)	Discharged Points
8	20	Pass	All accessible points where contact discharge cannot be applied such as Displays, Indicators light, Keyboard, Button, Switch, Knob, Air gap, Slots, Hole and so on

Indirect Application of ESD

Horizontal Coupling Plane under the EUT

Applied Voltage (kV)	No. of Discharge for each point	Result (Pursuant to EN IEC 55014-2)	Discharged Point
4	20	Pass	At the front edge of each HCP opposite the centre point of each unit of the EUT

Vertical Coupling Plane beside the EUT

Applied Voltage (kV)	No. of Discharge for each point	Result (Pursuant to EN IEC 55014-2)	Discharged Point
4	20	Pass	The centre of the vertical edge of the coupling plane

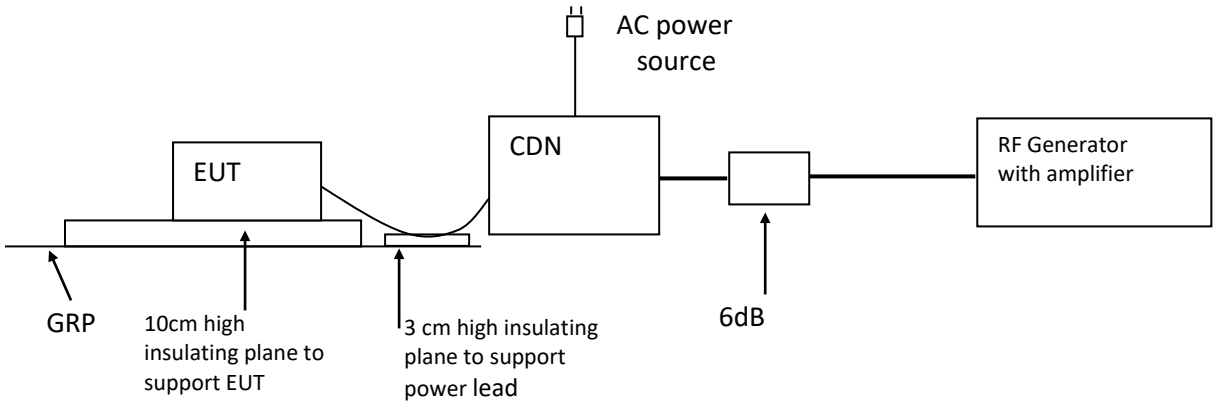
TEST REPORT

8.2 EN 61000-4-6(Pursuant to EN IEC 55014-2) Injected Current (0.15 MHz to 230 MHz)

Performance criterion: A

Test Result: Pass

8.2.1 Block Diagram of Test Setup



8.2.2 Test Setup and Procedure

The EUT was placed on an insulating support of 0.1m height above a ground reference Plane, arranged and connected to satisfy its functional requirement.

All relevant cables were provided with the appropriate coupling and decoupling devices at a distance between 0.1m and 0.3m from the projected geometry of the EUT on an insulating support of 0.03m height above the ground reference plane.

Test voltage was verified before each testing though power meter combined in the RF generator with AMP.

Dwell time was set to 3s and step was set as 1% to keep sufficient response time for EUT. The frequency from 0.15MHz to 230MHz was checked.

8.2.3 Test Result

Port:	Frequency (MHz)	Level (Pursuant to EN IEC 55014-2)	Result
A.C. Power Lines	0.15 to 230	3V (r.m.s.)	Pass
D.C. Power Lines	0.15 to 230	1V (r.m.s.)	N/A
Signal Lines	0.15 to 230	1V (r.m.s.)	N/A
Control Lines	0.15 to 230	1V (r.m.s.)	N/A

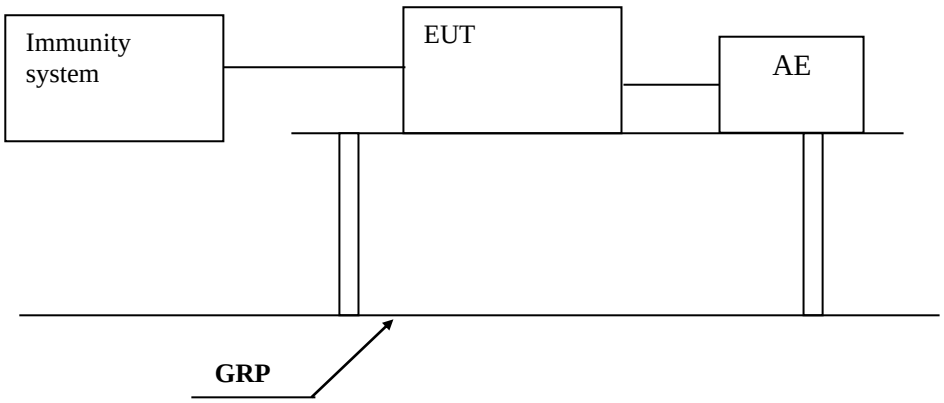
TEST REPORT

8.3 EN 61000-4-4(Pursuant to EN IEC 55014-2) Electrical Fast Transient/Burst

Performance criterion: B

Test Result: Pass

8.3.1 Block Diagram of Test Setup



8.3.2 Test Setup and Procedure

The EUT was placed on a 0.1m high wooden table, standing on the ground reference plane 3m by 2m in size, made by steel 1mm thick.

The distance between the EUT and any other of the metallic surface except the GRP was greater than 0.5m.

The mains lead excess than 0.5m was folded to avoid a flat coil and situated at a distance of 0.1m above the ground reference plane to insure the distance between the coupling device and the EUT was 0.5m.

The EUT was arranged and connected to satisfy its functional requirement and supplied by the coupling-decoupling network.

8.3.3 Test Result

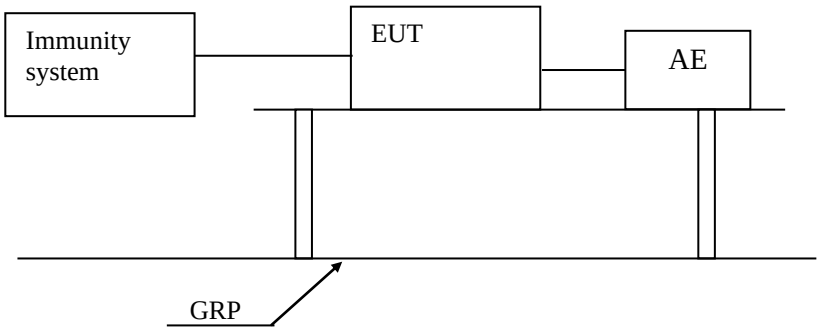
Level (Pursuant to EN IEC 55014-2)	Polarity	A.C. Power supply line and protective earth terminal	D.C. Power Lines, Signal Line & Control Line
0.5kV	+	N/A	N/A
0.5kV	-	N/A	N/A
1kV	+	Pass	N/A
1kV	-	Pass	N/A

TEST REPORT

8.4 EN 61000-4-5(Pursuant to EN IEC 55014-2) Surge Immunity

Performance criterion: B
Test Result: Pass

8.4.1 Block Diagram of Test Setup



8.4.2 Test Setup and Procedure

The surge was applied to the EUT power supply terminals via the capacitive coupling network.

Decoupling networks were required in order to avoid possible adverse effects on equipment not under test that might be powered by the same lines and to provide sufficient decoupling impedance to the surge wave so that the specified wave might be developed on the lines under test.

The EUT was arranged and connected according to its functional requirements.

The EUT was placed on a 0.1m high wooden support above the GRP), supplied by the coupling-decoupling network, and arranged and connected to satisfy its functional requirement. The power cord between the EUT and the coupling/decoupling network was less than 2 meters.

8.4.3 Test Result

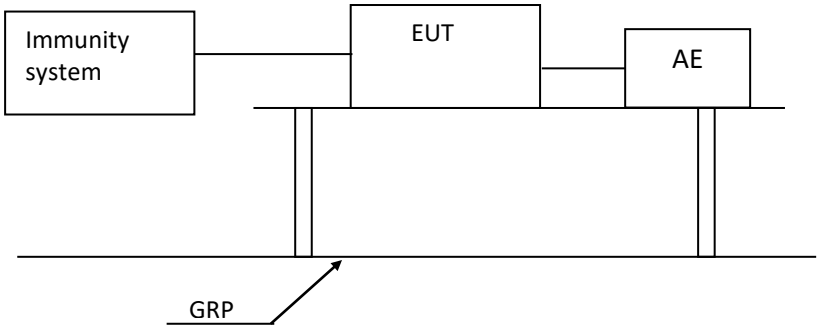
Level (Pursuant to EN IEC 55014-2)	Result
Between Phase And Phase: 1kV	N/A
Between Phase And Neutral: 1kV	Pass
Between Phase And Earth: 2kV	Pass
Between Neutral And Earth: 2kV	Pass

TEST REPORT

8.5 EN IEC 61000-4-11(Pursuant to EN IEC 55014-2) Voltage Dips and Interruptions

Performance criterion: C
Test Result: Pass

8.5.1 Block Diagram of Test Setup



8.5.2 Test Setup and Procedure

The EUT was placed on an insulating support of 0.8m height, standing on a ground reference plane, and arranged and connected to satisfy its functional requirement

The test was performed with the EUT connected to the test generator with the shortest power supply cable as specified by the EUT manufacturer.

The EUT was tested for each selected combination of test level and duration with a sequence of three dips/interruptions with intervals of 10 s minimum. Each representative mode of operation was tested.

Abrupt changes in supply voltage was occur at zero crossings of the voltage.

8.5.3 Test Result

Test condition (Pursuant to EN IEC 55014-2)				
Test Level in %U_T	50 Hz		60 Hz	
	Duration	Result	Duration	Result
0	0.5	Pass	0.5	N/A
40	10	Pass	12	N/A
70	25	Pass	30	N/A

Remark: UT is the rated voltage for the equipment.

TEST REPORT

8.6 EN 61000-4-3(Pursuant to EN IEC 55014-2) Radiated Electromagnetic Field Immunity

Performance criterion: A
Test Result: **Not Applicable**
Remark:
Containing electronic control circuitry with no internal clock frequency or oscillator frequency higher than 15 MHz.

TEST REPORT

9. APPENDIX I - PHOTOS OF TEST SETUP

Conducted Emission

Radiated Power


TEST REPORT

Clicks

Harmonics and Flicker


TEST REPORT

ESD Immunity

Inject current immunity


TEST REPORT

EFT Immunity



Surge and DIP Immunity



TEST REPORT

10. APPENDIX II – PHOTOS OF EUT





TEST REPORT





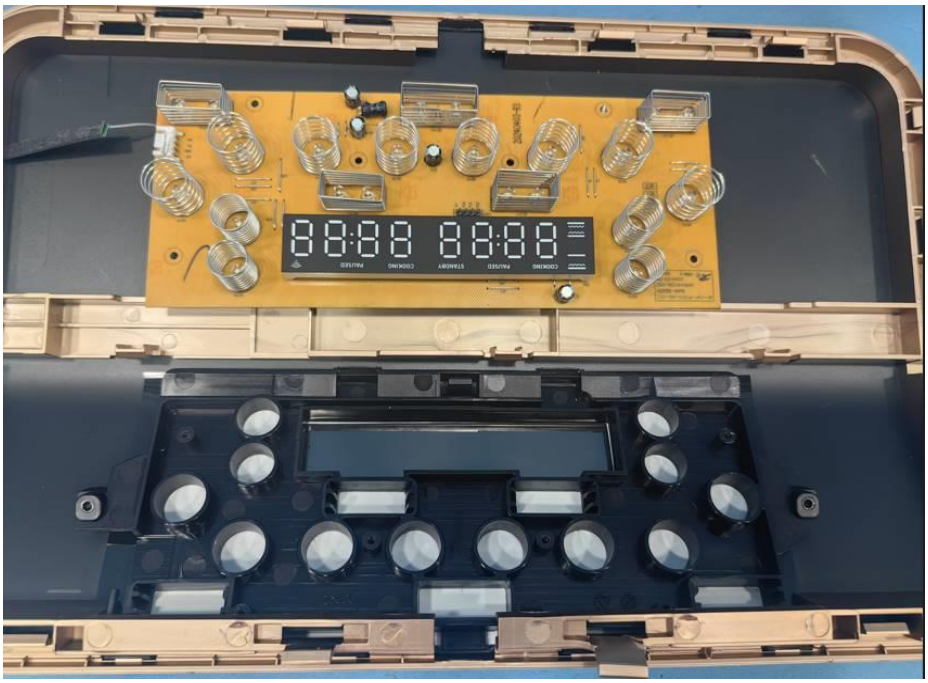
TEST REPORT



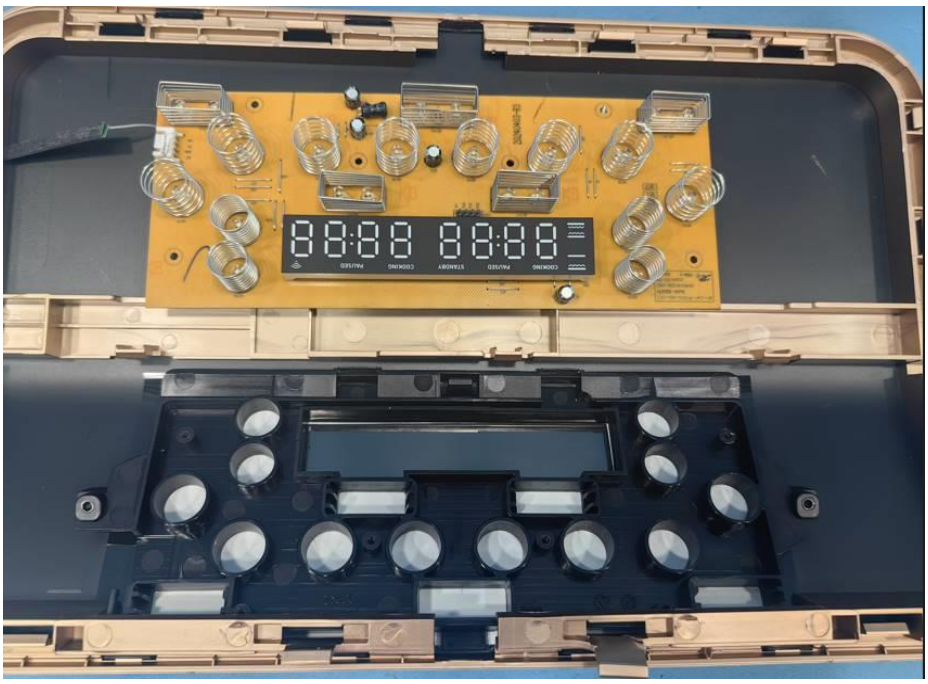


TEST REPORT





TEST REPORT



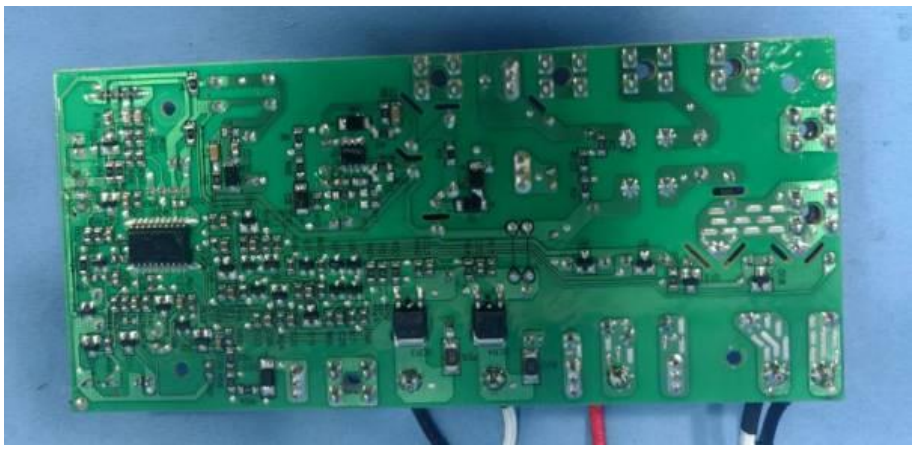


TEST REPORT





TEST REPORT



**********End of Report**********