



**SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch**

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Report No.: GZEM180300125701

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TEST REPORT

Application No.: GZEM1803001257HS
Applicant: Hisense Ronshen (Guangdong) Refrigerator Co., Ltd.
Address of Applicant: No.8 Ronggang Road, Ronggui, Shunde, Foshan, Guangdong, PRC
Manufacturer: The same as Applicant
Address of Manufacturer: The same as Applicant
Factory: The same as Applicant
Address of Factory: The same as Applicant
Equipment Under Test (EUT):
EUT Name: Frost Free Refrigerator Freezer
Model No.: RF702N4IS1, RT-70WC4S1, RF715N4AS1, RT-72WC4S1. □
□ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Standards: EN 55014-1:2017
EN 55014-2:2015
EN 61000-3-2:2014
EN 61000-3-3:2013
Date of Receipt: 2018-03-16
Date of Test: 2018-03-26 to 2018-03-28
Date of Issue: 2018-04-03

Test Result :	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EU Declaration of Conformity and compliance with all relevant EU Directives.





Kobe Jian
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2018-04-03		Original

Authorized for issue by:				
Tested By		 Jenny Chen /Project Engineer		2018-03-26 to 2018-03-28 Date
Checked By		 Cherie Luo /Reviewer		2018-04-02 Date



2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Disturbance at Mains Terminals (150kHz-30MHz)	EN 55014-1:2017	CISPR 16-2-1	N/A	Pass
Disturbance Power	EN 55014-1:2017	CISPR 16-2-2	N/A	Pass
Discontinuous Disturbance (150kHz-30MHz)	EN 55014-1:2017	EN 55014-1:2017	N/A	Pass
Harmonic Current Emission	EN 61000-3-2:2014	EN 61000-3-2:2014	Class A	Pass
Voltage Fluctuations and Flicker	EN 61000-3-3:2013	EN 61000-3-3:2013	Clause 5 of EN 61000-3-3	Pass

N/A: Not applicable

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN 55014-2:2015	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Electrical Fast Transients/Burst at Power Port and Signal lines	EN 55014-2:2015	EN 61000-4-4:2012	AC cable: $\pm 1.0\text{kV}$ Signal lines: $\pm 0.5\text{kV}$ 5/50ns Tr/Th 5kHz Repetition Frequency	Pass
Surge at Power Port	EN 55014-2:2015	EN 61000-4-5:2014	1.2/50 μs Tr/Th 1kV Line to Line 2kV Line to Ground	Pass
Conducted Immunity at Power Port and Signal lines(150kHz-230MHz)	EN 55014-2:2015	EN 61000-4-6:2014	AC: 3V r.m.s (emf), Signal lines: 1V r.m.s (emf), 80%, 1kHz Amp. Mod.	Pass
Voltage Dips and Interruptions	EN 55014-2:2015	EN 61000-4-11:2004	0 % UT for 0.5per 40 % UT for 10per 70 % UT for 25per UT is Supply Voltage	Pass

✧ **Declaration of EUT Family Grouping:**

Model No.: RF702N4IS1, RT-70WC4S1, RF715N4AS1, RT-72WC4S1.

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference on the function and control board.

Details were shown as below:

Model No.	Control board	Ice maker and water intaking
RF702N4IS1, RT-70WC4S1	Control board 1	With
RF715N4AS1, RT-72WC4S1	Control board 2	Without

In addition, models listed in both row of below table were identical, except for the model name.

Model No.	Model No.
RF702N4IS1	RT-70WC4S1
RF715N4AS1	RT-72WC4S1

Therefore full tests were performed on models **RF702N4IS1** & **RF715N4AS1** in this report.



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4 General Information

4.1 Details of E.U.T.

Power Supply: AC 220-240V, 50Hz
Test Voltage: AC 230V 50Hz
Cable: 3 wires about 1.8m unscreened AC mains cable

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conducted Disturbance	3.63dB (9kHz to 150kHz)
		3.22dB (150kHz to 30MHz)
2	Disturbance Power	3.78dB
3	Radiated Disturbance	5.0dB (30MHz-1GHz)
		5.0dB (1GHz-6GHz)
4	Radiated Immunity	2.18dB
5	Conducted Immunity	3.5dB
6	ESD	6 %
7	EFT (Electrical Fast Transients)	4 %
8	Surge Immunity	6%
9	Voltage Dips and Interruptions	4 %
10	20 System	1.5dB
11	Temperature Test	0.4°C
12	Humidity Test	1.3%
13	DC power Test	0.5 %

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
 198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,
 Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.5 Test Facility

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

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

- **FCC (Registration No.: 282399)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002.

- **Industry Canada (Registration No.: 4620B-1)**

The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Certification and Engineering of Industry Canada for radio equipment testing with Registration No. 4620B-1.

- **VCCI (Registration No.: R-2460, C-2584, G-449 and T-1179)**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co. Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2460, C-2584, G-449 and T-1179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.



4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 Monitoring of EUT for All Immunity Test

Visual: LED display indication.

Audio: N/A



5 Equipment List

Conducted Disturbance at Mains Terminals (150kHz-30MHz)						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal.Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m ³	N/A	2016-12-27	2019-12-26
EMC0118	Two-line v-netwok	R&S	ENV216	100359	2018-01-19	2019-01-18
EMC0102	LISN	SCHAFFNER CHASE	MN2050D/1	1421	2017-09-20	2018-09-19
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	2017-11-27	2018-11-26
EMC0107	Coaxial Cable	SGS	2m	N/A	2016-07-24	2018-07-23
EMC0106	Voltage Probe	SGS	N/A	N/A	2016-04-05	2018-04-04
EMC2123	8 Line ISN Cat 6	SCHWARZBECK MESS-ELEKTRONIK	NTFM 8158	NTFM 8158 0151	2017-06-23	2018-06-22
EMC2124	8 Line ISN Cat 5	SCHWARZBECK MESS-ELEKTRONIK	CAT5 8158	CAT5 8158-188	2017-06-23	2018-06-22
EMC2126	8 Line ISN Cat 3	SCHWARZBECK MESS-ELEKTRONIK	CAT3 8158	CAT38158-0081	2017-06-23	2018-06-22
EMC2122	ISN S8	SCHWARZBECK MESS-ELEKTRONIK	ISN S8	57	2017-06-23	2018-06-22
EMC2121	ISN S1	SCHWARZBECK MESS-ELEKTRONIK	ISN S1	10	2017-06-23	2018-06-22
EMC2125	2 wires ISN	SCHWARZBECK MESS-ELEKTRONIK	NTFM 8131	8131-198	2017-06-23	2018-06-22
EMC2047	CDN	Elektronik- Feinmechanik	L-801:AF2	2793	2015-09-19	2018-09-18
EMC2048	CDN	Elektronik- Feinmechanik	L-801:M2/M3	2738	2015-09-25	2018-09-24
EMC2062	6dB Attenuator	HP	8491A	24487	2016-04-05	2018-04-04
EMC0167	Conical metal housing	SGS-EMC	N/A	N/A	2016-04-19	2018-04-18

Disturbance Power						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal.Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m ³	N/A	2016-12-27	2019-12-26
EMC2040	Absorbing Clamp	Beijing Dazhe Co. Ltd.	ZN23201	N/A	2018-01-11	2019-01-10
EMC0303	7m Coaxial Cable	SGS	7m	N/A	2017-6-30	2019-06-29
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	2017-11-27	2018-11-26
EMC2062	6dB Attenuator	HP	8491A	24487	2016-04-05	2018-04-04
EMC0305	Slide Bar Controller	HD-GmbH	HD50	050/490	N/A	N/A
EMC0103	Slide Bar RP	HD-GmbH	KMS560	560/392	N/A	N/A



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Discontinuous Disturbance (150kHz-30MHz)						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal.Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC2049	Click Meter	AFJ	CL55C	55049840042	2017-06-19	2018-06-18
EMC0206	Coaxial Cable	N/A	1.5m	N/A	2016-09-20	2018-09-19
EMC0203	LISN	AFJ	LS16-OPT001	16019831056	2018-01-08	2019-01-07

Harmonic Current Emission / Voltage Fluctuations and Flicker						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal.Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC0608	AC Power Source	California	50001iX	56627	2018-03-19	2019-03-18
EMC0607	Power Analyzer	California	PACS	72400	2018-03-19	2019-03-18

Electrostatic Discharge						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal.Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC2071	ESD Simulator	TESEQ AG	NSG 435	6739	2018-02-24	2019-02-23
EMC0804	ESD Ground Plane	SGS	3m x 3m	N/A	N/A	N/A
EMC0078	Temperature, & Humidity	Shanghai Meteorological Instrument factory Co., Ltd.	ZJ1-2B	709131	2017-07-19	2018-07-18

Electrical Fast Transients/Burst at Power Port, Surge at Power Port and Voltage Dips and Interruptions						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal.Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC2059	Modular Impulse Surge Generator	EMC PARTNER	MIG0603EN	259	2018-01-08	2019-01-07
EMC2060	High speed signal Surge CDN	EMC PARTNER	CDN-UTP	CDN-UTP0089	2018-01-08	2019-01-07
EMC2072	EMC Immunity Test System	TESEQ AG	NSG 3060 CDN3061 INA 6502 CIB CDN3425	1580 1466 222	2018-01-08	2019-01-07
EMC2055	Oscilloscope 500MHz	Tektronix	TDS3052C	C011815	2018-01-08	2019-01-07



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Conducted Immunity at Power Port and Signal lines(150kHz-230MHz)						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal.Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC1101	Signal Generator	Rohde & Schwarz	SMY01	825675/016	2017-06-19	2018-06-18
EMC1102	Amplifier 0.15-230MHz	SCHAFFNER	GRF5048	1003	2017-06-19	2018-06-18
EMC1103	Power Meter	Rohde & Schwarz	NRVS	825770/079	2017-12-04	2018-12-03
EMC1105	Dual Directional coupler	Werlatone Inc.	C1795	6635	2017-06-19	2018-06-18
EMC2012	Oscilloscope	Tektronix	TDS 744A	N/A	2017-12-01	2018-11-30
EMC2048	CDN	Elektronik- Feinmechanik	L-801:M2/M3	2738	2015-09-25	2018-09-24
EMC1107	CDN M2	Schaffner Chase	CDN-M2-16	9863	2017-10-26	2020-10-25
EMC1116	Current Probe	Schaffner Chase	CIP9136	1155	2017-10-26	2020-10-25
EMC1117	Current Probe	Schaffner Chase	CSP8445	18	2017-10-26	2020-10-25

General used equipment						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal.Due date
					(YYYY-MM-DD)	(YYYY-MM-DD)
EMC0006	DMM	Fluke	73	70681569	2017-07-26	2018-07-25
EMC0007	DMM	Fluke	73	70671122	2017-07-26	2018-07-25

6 Emission Test Results

6.1 Conducted Disturbance at Mains Terminals (150kHz-30MHz)

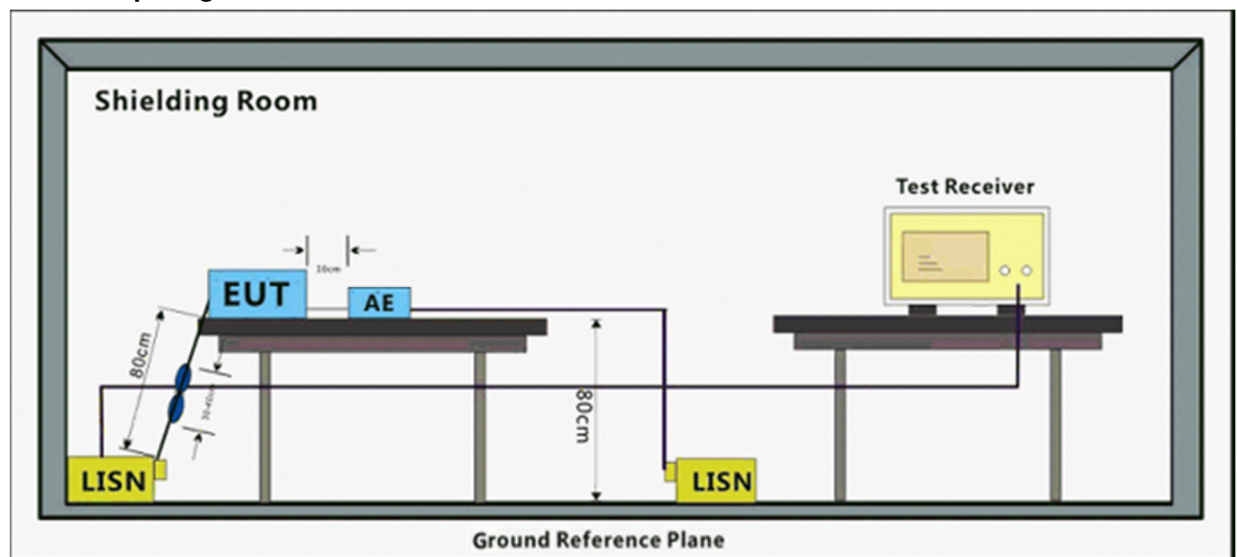
Test Requirement:	EN 55014-1:2017
Test Method:	CISPR 16-2-1
Frequency Range:	150kHz to 30MHz
Limit:	
0.15MHz-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 59dB(μV)-46dB(μV) average
0.5MHz-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5MHz-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 150KHz to 30MHz

6.1.1 E.U.T. Operation

Operating Environment:

Temperature:	21 °C	Humidity:	53 % RH	Atmospheric Pressure:	1015 mbar
Test Mode:	a: Test the EUT in cooling mode, the thermostat shall be adjusted to the middle of the adjustment range.				

6.1.2 Test Setup Diagram



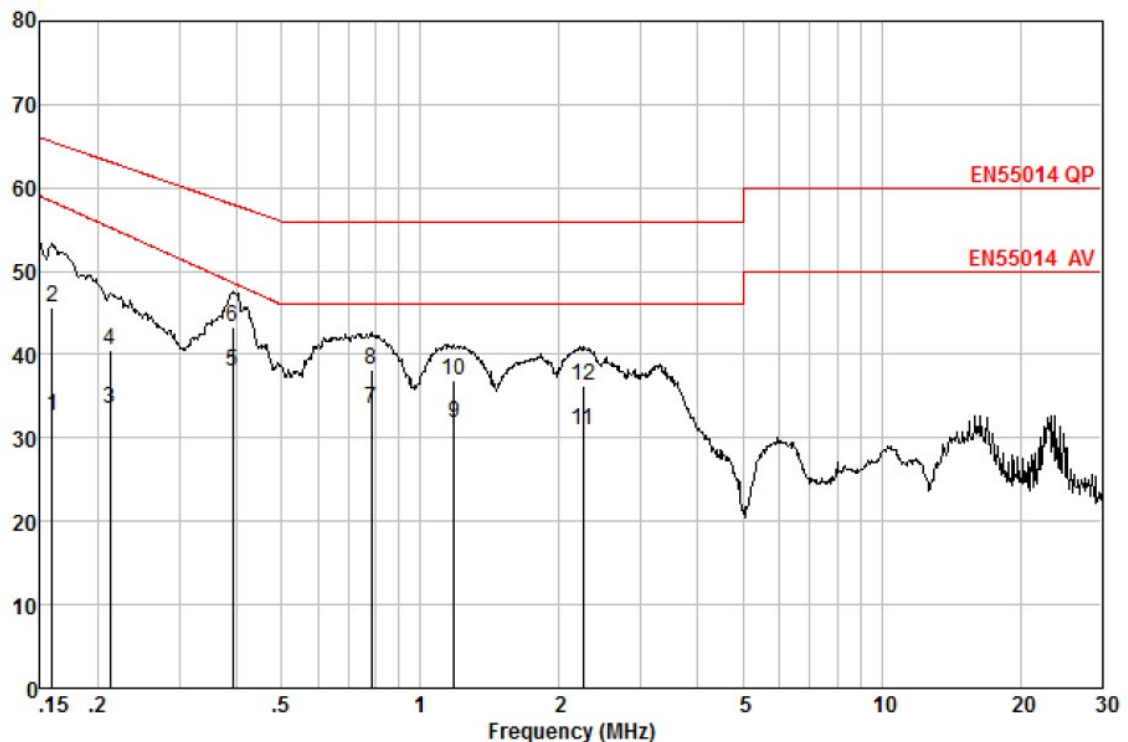
6.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

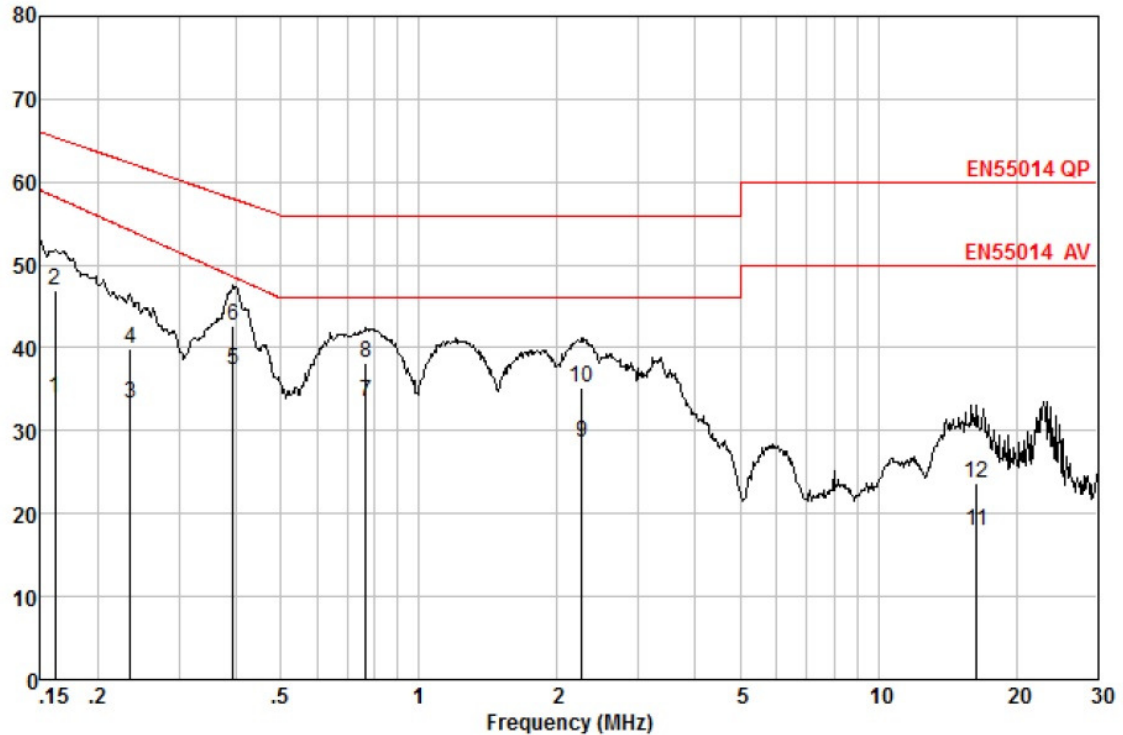
For Model RF702N4IS1

Live Line

Level (dBμV)



Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
MHz	dBμV	dB	dB	dBμV	dBμV	dB	
0.159	22.91	9.65	0.00	32.56	58.37	-25.81	Average
0.159	35.93	9.65	0.00	45.58	65.52	-19.94	QP
0.213	23.83	9.64	0.00	33.47	55.22	-21.75	Average
0.213	30.99	9.64	0.00	40.63	63.10	-22.47	QP
0.391	28.42	9.64	0.00	38.06	48.65	-10.59	Average
0.391	33.63	9.64	0.00	43.27	58.03	-14.76	QP
0.783	23.82	9.65	0.01	33.48	46.00	-12.52	Average
0.783	28.62	9.65	0.01	38.28	56.00	-17.72	QP
1.184	22.12	9.66	0.02	31.80	46.00	-14.20	Average
1.184	27.12	9.66	0.02	36.80	56.00	-19.20	QP
2.249	21.25	9.67	0.05	30.97	46.00	-15.03	Average
2.249	26.59	9.67	0.05	36.31	56.00	-19.69	QP

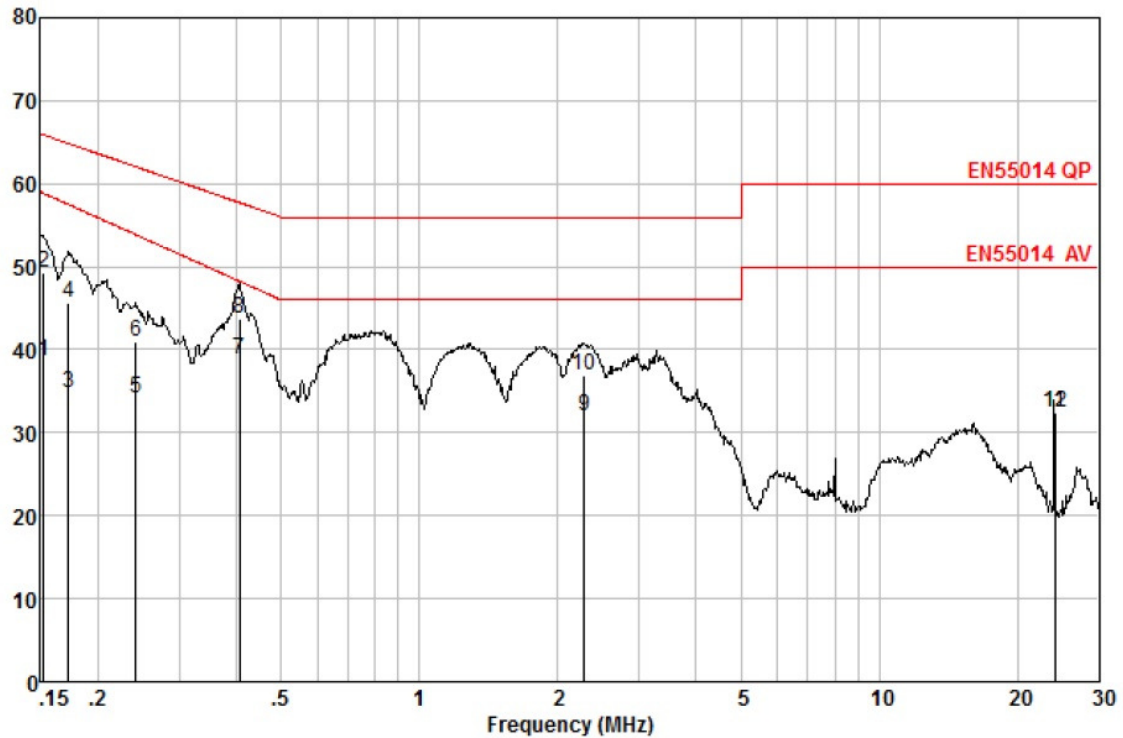
Neutral Line
Level (dBμV)

Freq	Read	LISN	Cable	Limit	Over	Remark
MHz	Level	Factor	Loss	Line	Limit	
	dBμV	dB	dB	dBμV	dBμV	dB
0.162	24.26	9.67	0.00	33.93	58.20	-24.27 Average
0.162	37.20	9.67	0.00	46.87	65.38	-18.51 QP
0.235	23.59	9.66	0.00	33.25	54.14	-20.89 Average
0.235	30.33	9.66	0.00	39.99	62.26	-22.27 QP
0.393	27.61	9.67	0.00	37.28	48.59	-11.31 Average
0.393	33.02	9.67	0.00	42.69	57.99	-15.30 QP
0.767	23.82	9.67	0.01	33.50	46.00	-12.50 Average
0.767	28.61	9.67	0.01	38.29	56.00	-17.71 QP
2.261	18.77	9.69	0.06	28.52	46.00	-17.48 Average
2.261	25.51	9.69	0.06	35.26	56.00	-20.74 QP
16.398	7.53	10.03	0.30	17.86	50.00	-32.14 Average
16.398	13.34	10.03	0.30	23.67	60.00	-36.33 QP

For Model RF715N4AS1

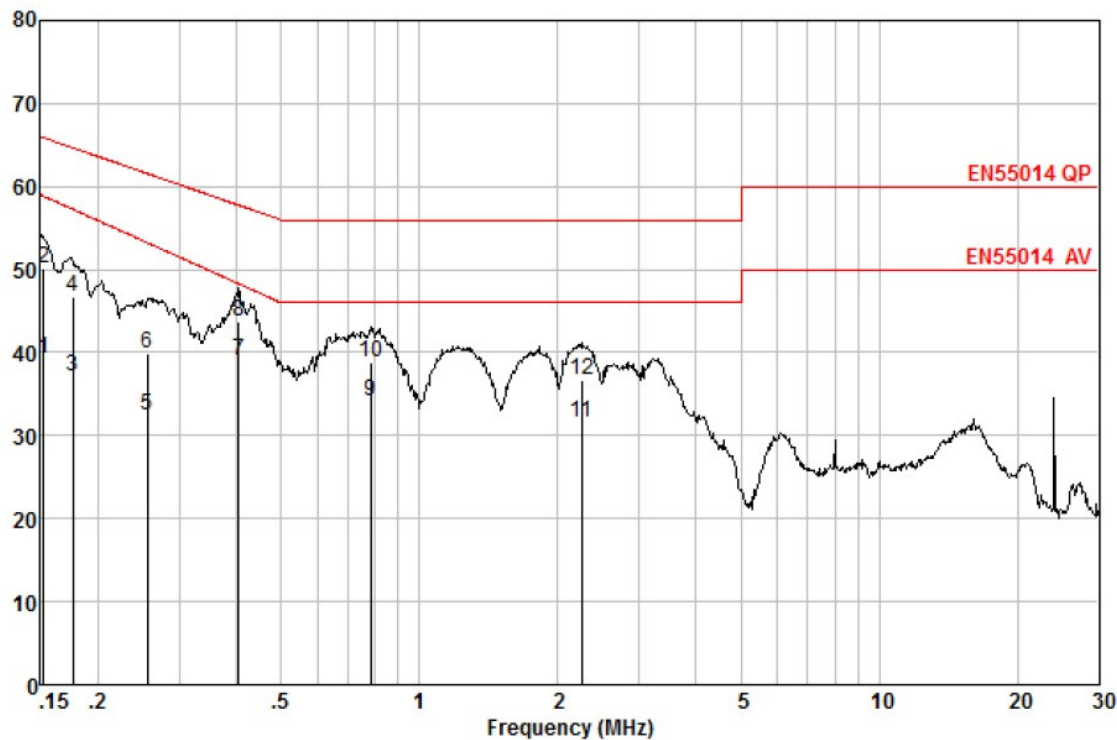
Live Line

Level (dBμV)



Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
MHz	dBμV	dB	dB	dBμV	dBμV	dB	
0.152	28.82	9.65	0.10	38.57	58.83	-20.26	Average
0.152	39.62	9.65	0.10	49.37	65.87	-16.50	QP
0.172	25.09	9.65	0.00	34.74	57.51	-22.77	Average
0.172	36.11	9.65	0.00	45.76	64.86	-19.10	QP
0.242	24.41	9.64	0.00	34.05	53.85	-19.80	Average
0.242	31.38	9.64	0.00	41.02	62.04	-21.02	QP
0.406	29.24	9.64	0.00	38.88	48.24	-9.36	Average
0.406	34.16	9.64	0.00	43.80	57.73	-13.93	QP
2.285	22.28	9.67	0.06	32.01	46.00	-13.99	Average
2.285	27.14	9.67	0.06	36.87	56.00	-19.13	QP
24.070	21.96	10.20	0.30	32.46	50.00	-17.54	Average
24.070	22.01	10.20	0.30	32.51	60.00	-27.49	QP

Neutral Line
Level (dBμV)



Freq	Read	LISN	Cable	Limit	Over	Remark
MHz	Level	Factor	Loss	Line	Limit	
	dBuV	dB	dB	dBuV	dBuV	dB
0.152	29.53	9.67	0.10	39.30	58.83	-19.53 Average
0.152	40.41	9.67	0.10	50.18	65.87	-15.69 QP
0.176	27.38	9.67	0.00	37.05	57.28	-20.23 Average
0.176	37.04	9.67	0.00	46.71	64.68	-17.97 QP
0.256	22.79	9.66	0.00	32.45	53.22	-20.77 Average
0.256	30.30	9.66	0.00	39.96	61.56	-21.60 QP
0.404	29.27	9.67	0.00	38.94	48.30	-9.36 Average
0.404	34.00	9.67	0.00	43.67	57.77	-14.10 QP
0.783	24.44	9.67	0.01	34.12	46.00	-11.88 Average
0.783	29.17	9.67	0.01	38.85	56.00	-17.15 QP
2.249	21.88	9.69	0.05	31.62	46.00	-14.38 Average
2.249	26.99	9.69	0.05	36.73	56.00	-19.27 QP

6.2 Disturbance Power

Test Requirement:	EN 55014-1:2017
Test Method:	CISPR 16-2-2
Frequency Range:	30MHz to 300MHz
Limit:	
30MHz- 300MHz	45dB(pw)-55dB(pw) quasi-peak, 35dB(pw)-45dB(pw) average
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30MHz to 300MHz

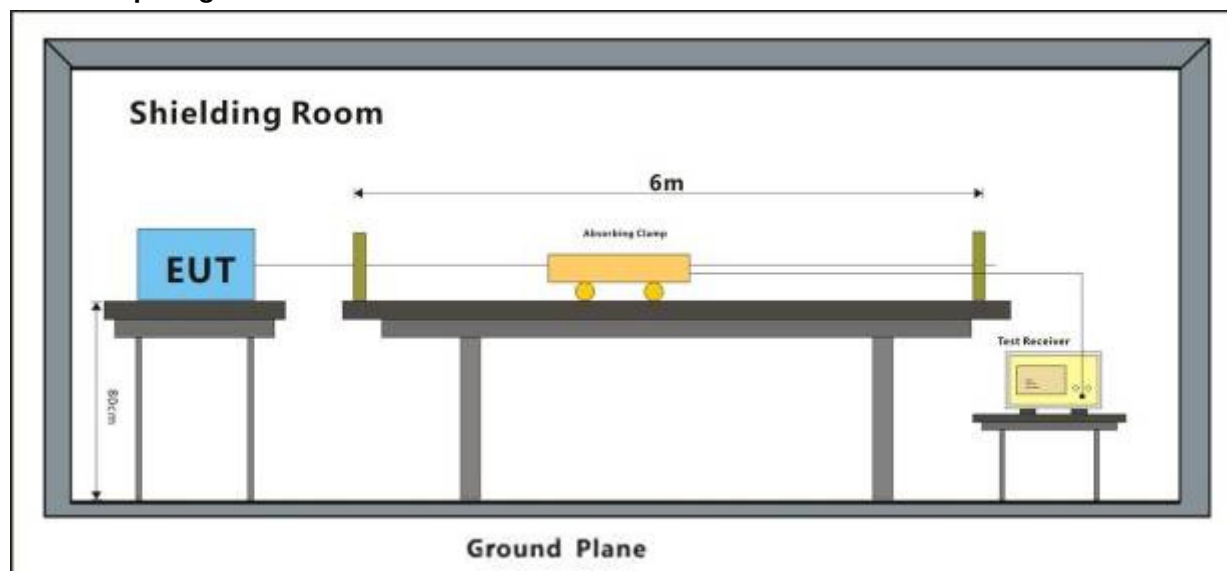
6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 53 % RH Atmospheric Pressure: 1015 mbar

Test Mode: a: Test the EUT in cooling mode, the thermostat shall be adjusted to the middle of the adjustment range.

6.2.2 Test Setup Diagram

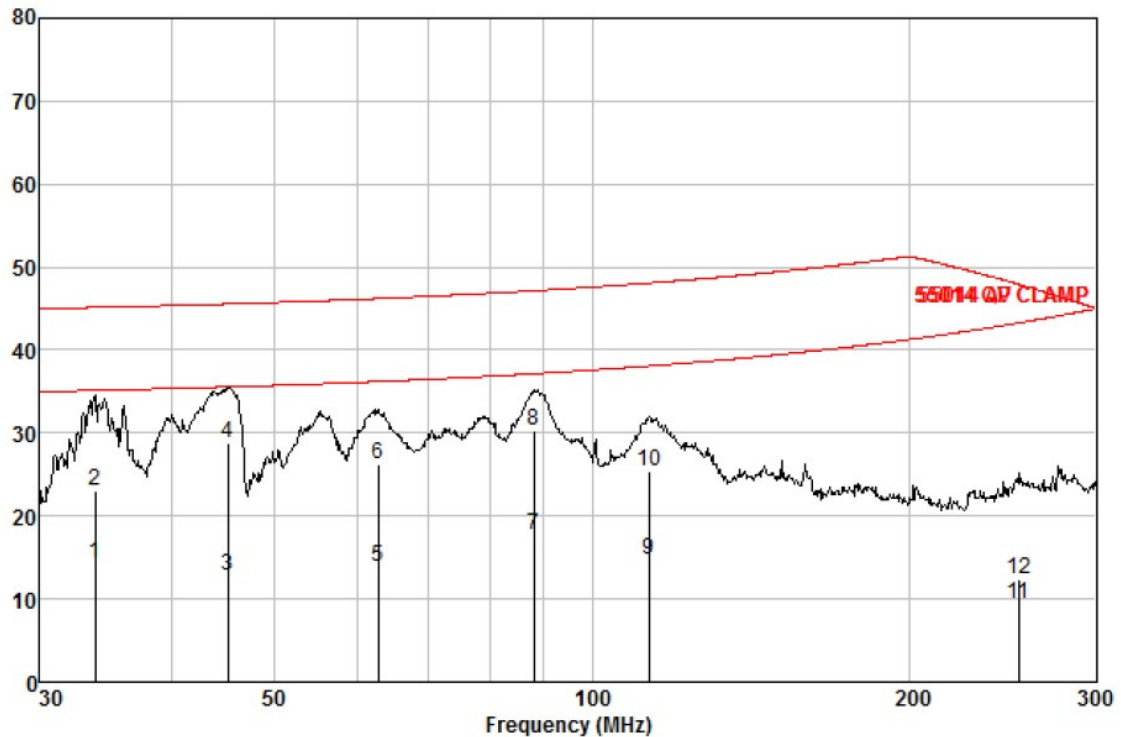


6.2.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

For Model RF702N4IS1

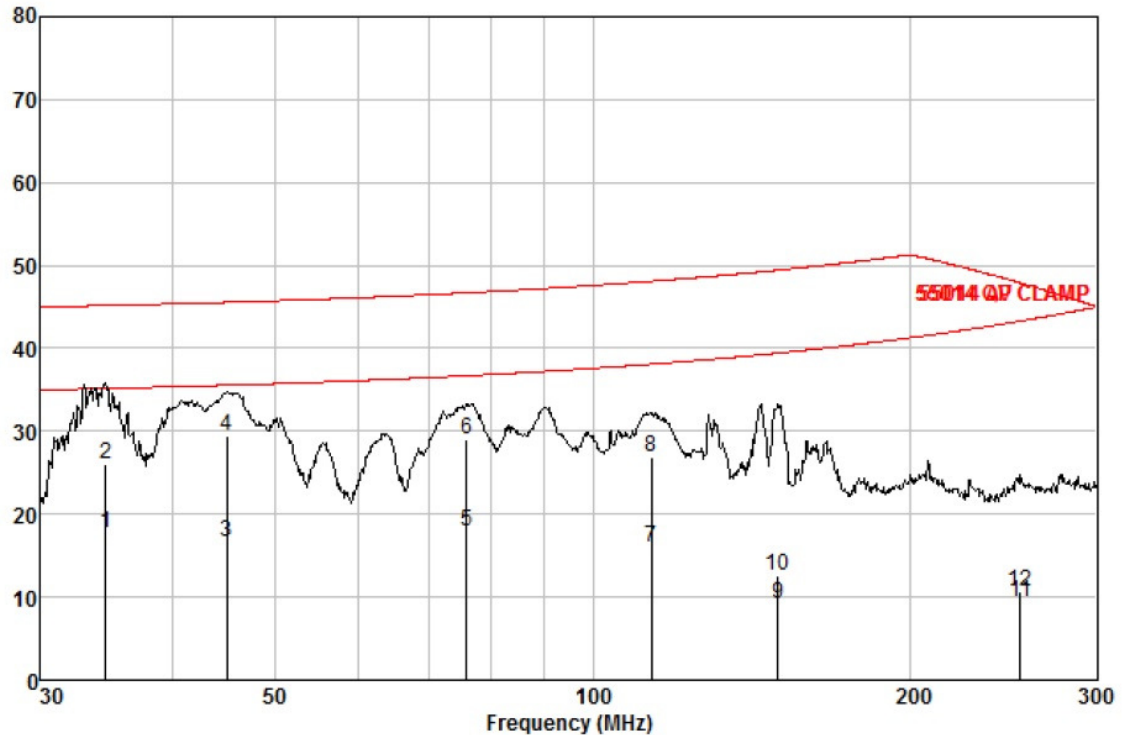
Level (dBpW)



Frequency MHz	Read Level dBuV	Cable Loss dB	Clamp Factor dBpW/dBuV	Measured Level dBpW	Limit Line dBpW	Over limit dB	Remark
33.816	10.76	1.23	2.25	14.24	35.14	-20.90	Average
33.816	19.63	1.23	2.25	23.11	45.14	-22.03	QP
45.198	11.99	1.51	-0.68	12.82	35.56	-22.74	Average
45.198	27.94	1.51	-0.68	28.77	45.56	-16.79	QP
62.679	13.14	1.79	-1.01	13.92	36.21	-22.29	Average
62.679	25.51	1.79	-1.01	26.29	46.21	-19.92	QP
88.129	15.62	2.17	-0.15	17.64	37.15	-19.51	Average
88.129	28.34	2.17	-0.15	30.36	47.15	-16.79	QP
113.272	11.10	2.66	0.94	14.70	38.08	-23.38	Average
113.272	21.85	2.66	0.94	25.45	48.09	-22.64	QP
253.584	5.13	4.05	0.19	9.37	43.28	-33.91	Average
253.584	8.19	4.05	0.19	12.43	47.92	-35.49	QP

For Model RF715N4AS1

Level (dBpW)



Frequency MHz	Read Level dBuV	Cable Loss dB	Clamp Factor dBpW/dBuV	Measured Level dBpW	Limit Line dBpW	Over limit dB	Remark
34.524	14.02	1.25	2.41	17.68	35.17	-17.49	Average
34.524	22.41	1.25	2.41	26.07	45.17	-19.10	QP
44.991	15.82	1.51	-0.70	16.63	35.56	-18.93	Average
44.991	28.73	1.51	-0.70	29.54	45.56	-16.02	QP
75.879	15.64	2.02	0.22	17.88	36.70	-18.82	Average
75.879	26.71	2.02	0.22	28.95	46.70	-17.75	QP
113.533	12.29	2.66	0.95	15.90	38.09	-22.19	Average
113.533	23.34	2.66	0.95	26.95	48.10	-21.15	QP
149.665	6.39	3.02	-0.27	9.14	39.43	-30.29	Average
149.665	9.80	3.02	-0.27	12.55	49.43	-36.88	QP
254.168	5.15	4.05	0.24	9.44	43.30	-33.86	Average
254.168	6.30	4.05	0.24	10.59	47.89	-37.30	QP

6.3 Discontinuous Disturbance (150kHz-30MHz)

Test Requirement: EN 55014-1:2017

Test Method: EN 55014-1:2017

Frequency Range: 150kHz to 30MHz

Limit:

Provision	Click Rate (N)		
1	All clicks < 20 ms	90 % click < 10 ms	$N \leq 5$
2	$N \leq 0,2$	$L_q^b = L^a + 44$	Clicks ^c $\leq 25\%$ exceed L_q^b
3	$30 \geq N > 0,2$	$L_q^b = L^a + 20 \lg(30/N)$	Clicks ^c $\leq 25\%$ exceed L_q^b

^a The limits L of Conducted Emissions apply also to discontinuous disturbances from all equipment which produce:
1) disturbances other than clicks, or
2) clicks with a click rate N equal to or greater than 30

^b The relevant limit L_q for continuous disturbance, as given in 4.1.1 for the measurement with the quasi-peak detector, increased by a certain value determined from the click rate N (see also 4.2.2.2)
The click limit applies to the disturbance assessed according to the upper quartile method

^c a quarter of the number of the clicks registered during the observation time T is allowed to exceed the click limit L_q

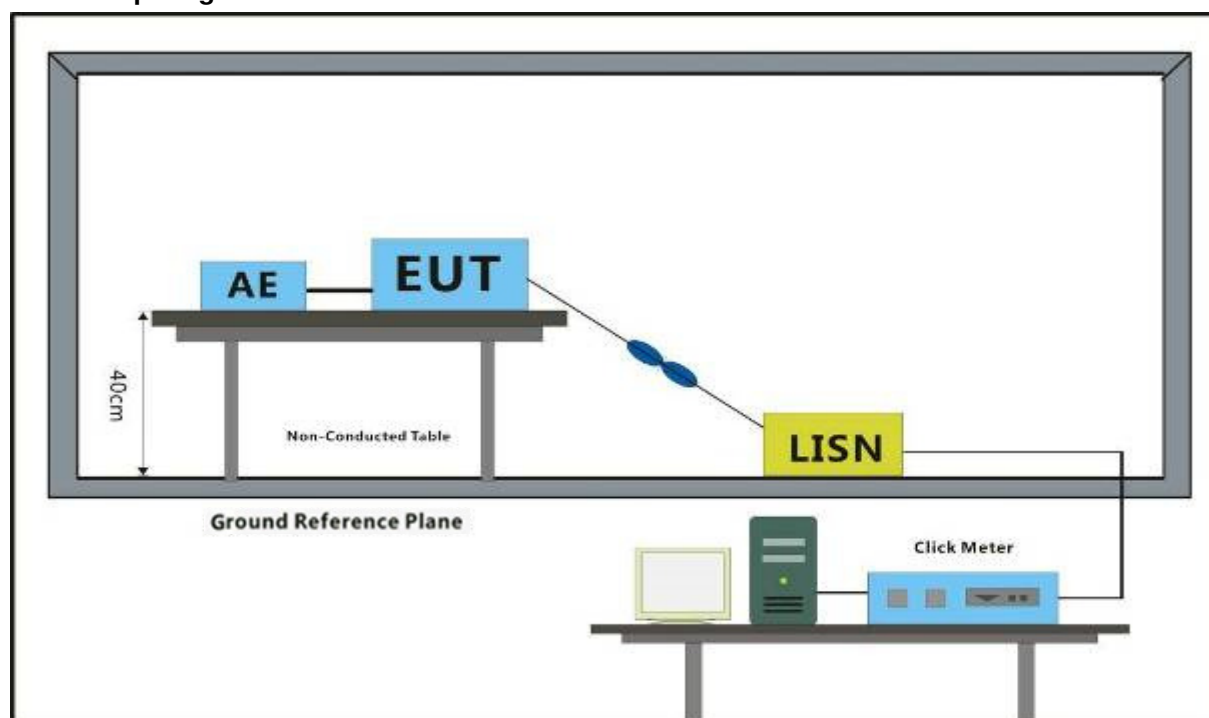
6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

Test Mode: a: Test the EUT in cooling mode, the thermostat shall be adjusted to the middle of the adjustment range.

6.3.2 Test Setup Diagram



6.3.3 Measurement Data

For Model RF702N4IS1

Meas Duration	2:00:00	LISN Phase -	Attenuation [dB]	40
Overload	NO			
Frequency	150 kHz	500 kHz	1.4 MHz	30 MHz
Clicks (< 10 ms)	20	10	4	0
Clicks (10ms - 20ms)	0	0	0	0
Clicks (> 20 ms)	0	0	0	0
Click Rate [1/min] (factor f = 0.50)	0.08	0.04	0.04	0.04
Continuous Disturbances	0	0	0	0
L [dBuV]	66	56	56	60
Lq [dBuV]	110	100	100	104
Clicks > Lq	0	0	0	0
Clicks > Lq [%]	0	0	0	0
Fridge Rules	0	0	0	0
600 ms Rule used	NO	NO	NO	NO
Overall Correction	.42	.32	.37	1.8
Margin for PK Detector	0	0	0	0
Result	PASSED	PASSED	PASSED	PASSED

For Model RF715N4AS1

Meas Duration	2:00:00	LISN Phase -	Attenuation [dB]	40
Overload	NO			
Frequency	150 kHz	500 kHz	1.4 MHz	30 MHz
Clicks (< 10 ms)	25	29	10	0
Clicks (10ms - 20ms)	0	0	0	0
Clicks (> 20 ms)	0	0	0	0
Click Rate [1/min] (factor f = 0.50)	0.10	0.12	0.12	0.12
Continous Disturbances	0	0	0	0
L [dBuV]	66	56	56	60
Lq [dBuV]	110	100	100	104
Clicks > Lq	0	0	0	0
Clicks > Lq [%]	0	0	0	0
Fridge Rules	0	0	0	0
600 ms Rule used	NO	NO	NO	NO
Overall Correction	.42	.32	.37	1.8
Margin for PK Detector	0	0	0	0
Result	PASSED	PASSED	PASSED	PASSED

6.4 Harmonic Current Emission

Test Requirement: EN 61000-3-2:2014

Test Method: EN 61000-3-2:2014

Frequency Range: 100Hz to 2kHz

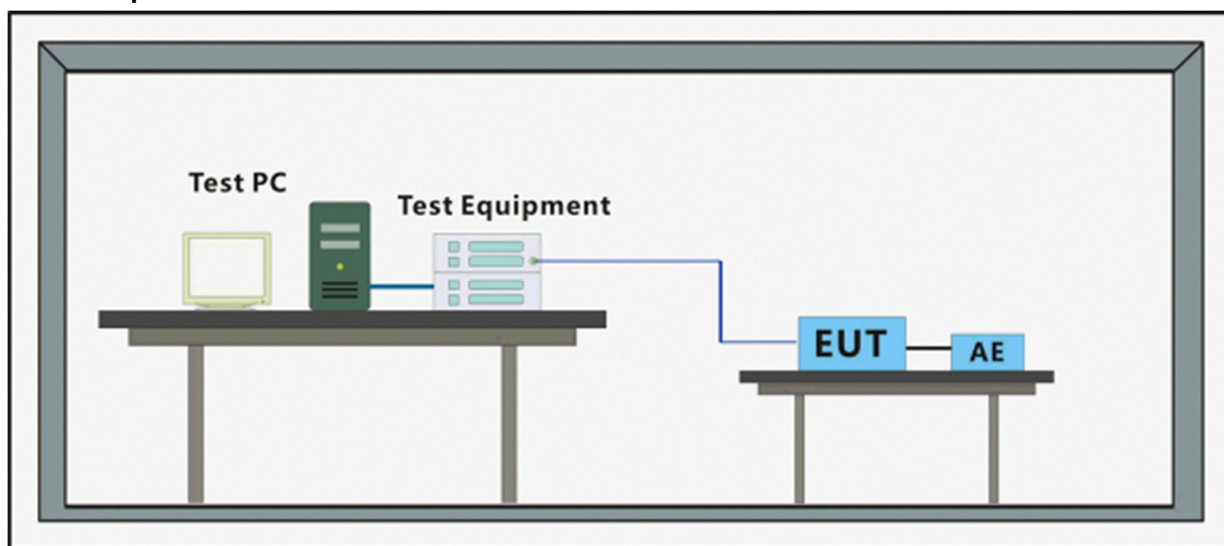
6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

Test Mode: b: Test the EUT in cooling mode, the thermostat shall be adjusted to the lowest setting.

6.4.2 Test Setup



6.4.3 Measurement Data

For Model RF702N4IS1

Harmonics – Class-A per Ed. 4.0 (Run time) incl. inter-harmonics

Current Test Result Summary (Run time)

Test Result: Pass Source qualification: Normal
 THC(A): 0.071 I-THD(%): 11.592 POHC(A): 0.007 POHC Limit(A): 0.251
 Highest parameter values during test:

V _{RMS} (Volts):	230.01	Frequency(Hz):	50.00
I _{Peak} (Amps):	0.969	I _{RMS} (Amps):	0.622
I _{Fund} (Amps):	0.613	Crest Factor:	1.558
Power (Watts):	119.5	Power Factor:	0.835

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.022	1.080	2.0	0.027	1.620	1.7	Pass
3	0.039	2.300	1.7	0.045	3.450	1.3	Pass
4	0.015	0.430	3.5	0.018	0.645	2.8	Pass
5	0.030	1.140	2.6	0.033	1.710	1.9	Pass
6	0.012	0.300	4.0	0.015	0.450	3.3	Pass
7	0.025	0.770	3.2	0.028	1.155	2.4	Pass
8	0.010	0.230	4.3	0.013	0.345	3.8	Pass
9	0.019	0.400	4.7	0.022	0.600	3.7	Pass
10	0.009	0.184	4.9	0.012	0.276	4.3	Pass
11	0.014	0.330	4.2	0.017	0.495	3.4	Pass
12	0.008	0.153	5.2	0.011	0.230	4.8	Pass
13	0.007	0.210	3.3	0.010	0.315	3.2	Pass
14	0.007	0.131	5.3	0.009	0.197	4.6	Pass
15	0.006	0.150	4.0	0.009	0.225	4.0	Pass
16	0.005	0.115	4.3	0.008	0.173	4.6	Pass
17	0.005	0.132	3.8	0.008	0.198	4.0	Pass
18	0.004	0.102	N/A	0.006	0.153	N/A	Pass
19	0.004	0.118	N/A	0.006	0.178	N/A	Pass
20	0.004	0.092	N/A	0.006	0.138	N/A	Pass
21	0.004	0.107	N/A	0.006	0.161	N/A	Pass
22	0.003	0.084	N/A	0.006	0.125	N/A	Pass
23	0.003	0.098	N/A	0.005	0.147	N/A	Pass
24	0.004	0.077	N/A	0.005	0.115	N/A	Pass
25	0.003	0.090	N/A	0.005	0.135	N/A	Pass
26	0.003	0.071	N/A	0.005	0.107	N/A	Pass
27	0.002	0.083	N/A	0.004	0.125	N/A	Pass
28	0.003	0.066	N/A	0.004	0.099	N/A	Pass
29	0.002	0.078	N/A	0.004	0.116	N/A	Pass
30	0.003	0.061	N/A	0.004	0.092	N/A	Pass
31	0.002	0.073	N/A	0.004	0.109	N/A	Pass
32	0.002	0.058	N/A	0.004	0.086	N/A	Pass
33	0.002	0.068	N/A	0.003	0.102	N/A	Pass
34	0.002	0.054	N/A	0.003	0.081	N/A	Pass
35	0.001	0.064	N/A	0.003	0.096	N/A	Pass
36	0.001	0.051	N/A	0.002	0.077	N/A	Pass
37	0.001	0.061	N/A	0.002	0.091	N/A	Pass
38	0.001	0.048	N/A	0.002	0.073	N/A	Pass
39	0.001	0.058	N/A	0.001	0.087	N/A	Pass
40	0.001	0.046	N/A	0.001	0.069	N/A	Pass



SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

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For Model RF715N4AS1

Harmonics – Class-A per Ed. 4.0 (Run time)

Current Test Result Summary (Run time)

Test Result: Pass Source qualification: Normal
THC(A): 0.387 I-THD(%): 55.140 POHC(A): 0.024 POHC Limit(A): 0.251
Highest parameter values during test:
V_RMS (Volts): 230.01 Frequency(Hz): 50.00
I_Peak (Amps): 1.128 I_RMS (Amps): 0.769
I_Fund (Amps): 0.751 Crest Factor: 1.467
Power (Watts): 136.3 Power Factor: 0.771

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.005	1.080	0.5	0.006	1.620	0.4	Pass
3	0.307	2.300	13.4	0.316	3.450	9.1	Pass
4	0.003	0.430	N/A	0.004	0.645	N/A	Pass
5	0.204	1.140	17.9	0.207	1.710	12.1	Pass
6	0.002	0.300	N/A	0.002	0.450	N/A	Pass
7	0.100	0.770	12.9	0.101	1.155	8.8	Pass
8	0.001	0.230	N/A	0.001	0.345	N/A	Pass
9	0.029	0.400	7.2	0.032	0.600	5.3	Pass
10	0.001	0.184	N/A	0.001	0.276	N/A	Pass
11	0.029	0.330	8.9	0.040	0.495	8.1	Pass
12	0.001	0.153	N/A	0.001	0.230	N/A	Pass
13	0.033	0.210	15.7	0.043	0.315	13.6	Pass
14	0.001	0.131	N/A	0.001	0.197	N/A	Pass
15	0.022	0.150	14.7	0.027	0.225	11.8	Pass
16	0.001	0.115	N/A	0.001	0.173	N/A	Pass
17	0.008	0.132	5.7	0.009	0.198	4.5	Pass
18	0.001	0.102	N/A	0.001	0.153	N/A	Pass
19	0.005	0.118	4.6	0.013	0.178	7.2	Pass
20	0.001	0.092	N/A	0.001	0.138	N/A	Pass
21	0.013	0.107	12.3	0.018	0.161	11.1	Pass
22	0.001	0.084	N/A	0.001	0.125	N/A	Pass
23	0.014	0.098	14.6	0.015	0.147	10.3	Pass
24	0.000	0.077	N/A	0.001	0.115	N/A	Pass
25	0.009	0.090	10.2	0.010	0.135	7.1	Pass
26	0.000	0.071	N/A	0.001	0.107	N/A	Pass
27	0.002	0.083	N/A	0.004	0.125	N/A	Pass
28	0.000	0.066	N/A	0.001	0.099	N/A	Pass
29	0.005	0.078	N/A	0.007	0.116	N/A	Pass
30	0.000	0.061	N/A	0.001	0.092	N/A	Pass
31	0.007	0.073	9.8	0.008	0.109	6.9	Pass
32	0.000	0.058	N/A	0.001	0.086	N/A	Pass
33	0.006	0.068	8.6	0.006	0.102	6.1	Pass
34	0.000	0.054	N/A	0.001	0.081	N/A	Pass
35	0.003	0.064	N/A	0.004	0.096	N/A	Pass
36	0.000	0.051	N/A	0.001	0.077	N/A	Pass
37	0.001	0.061	N/A	0.004	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.003	0.058	N/A	0.003	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

6.5 Voltage Fluctuations and Flicker

Test Requirement: EN 61000-3-3:2013

Test Method: EN 61000-3-3:2013

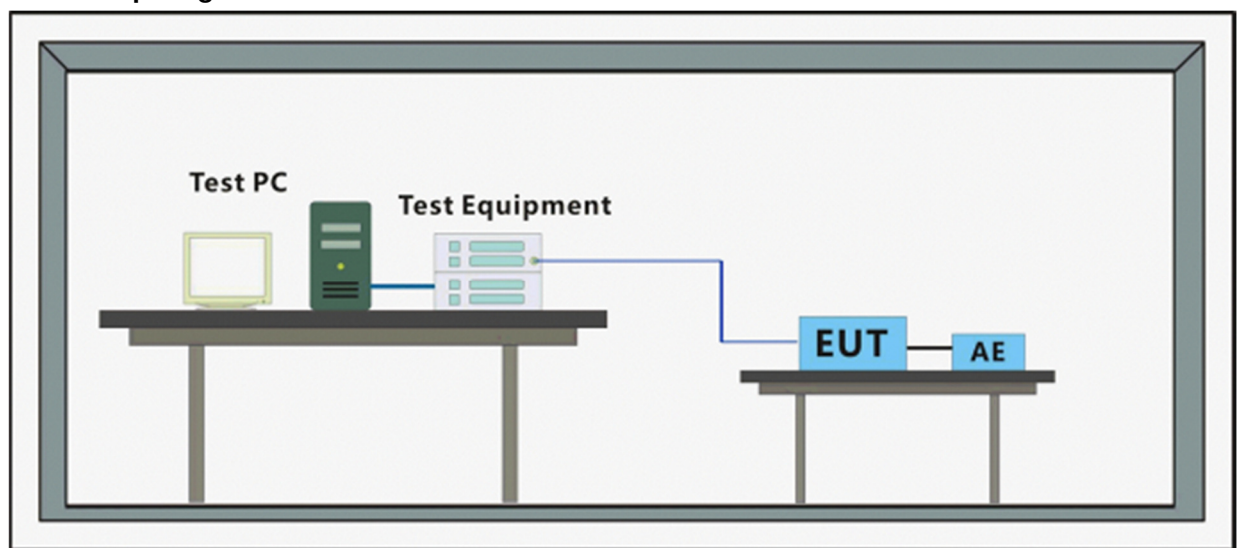
6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

Test Mode: a: Test the EUT in cooling mode, the thermostat shall be adjusted to the middle of the adjustment range.

6.5.2 Test Setup Diagram





6.5.3 Measurement Data

For Model RF702N4IS1

Flicker Test Summary per EN 61000-3-3 (Run time)

Test Result: Pass

Status: Test Completed

Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.03			
Highest dt (%):	0.13	Test limit (%):	N/A	N/A
T-max (mS):	0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.12	Test limit (%):	3.30	Pass
Highest dmax (%):	0.66	Test limit (%):	4.00	Pass

For Model RF715N4AS1

Flicker Test Summary per EN 61000-3-3 (Run time)

Test Result: Pass

Status: Test Completed

Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.99			
Highest dt (%):	0.56	Test limit (%):	N/A	N/A
T-max (mS):	0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.58	Test limit (%):	4.00	Pass

7 Immunity Test Results

7.1 Performance Criteria Description in EN 55014-2:2015

- | | |
|--------------------|---|
| 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 permissible 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 permissible 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 instructions for use. |

7.2 Electrostatic Discharge

Test Requirement:	EN 55014-2:2015
Test Method:	EN 61000-4-2:2009
Performance Criterion:	B
Discharge Impedance:	330Ω/150pF
Number of Discharge:	Minimum 10 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

7.2.1 E.U.T. Operation

Operating Environment:

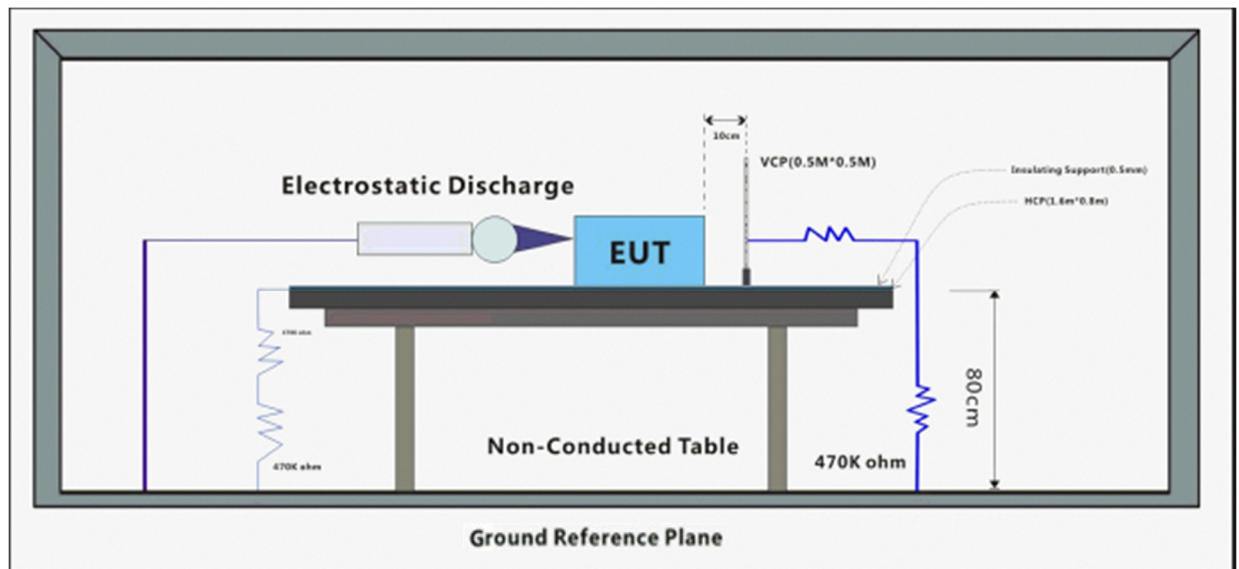
Temperature: 24 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

a: Test the EUT in cooling mode, the thermostat shall be adjusted to the middle of the adjustment range.

Test Mode: b: Test the EUT in cooling mode, the thermostat shall be adjusted to the lowest setting.

c: Test the EUT in idle mode.

7.2.2 Test Setup Diagram





7.2.3 Test Results:

For both models

Observations: Test Point:

Test points:

1. All insulated enclosure and seams.
2. All accessible metal parts of the enclosure.
3. All side

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	8	+	1	A
Air Discharge	8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	N/A
Horizontal Coupling	4	-	3	N/A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

Results:

A: No degradation in the performance of the EUT was observed.

N/A: Not applicable (not required by standard).

7.3 Electrical Fast Transients/Burst at Power Port

Test Requirement: EN 55014-2:2015
 Test Method: EN 61000-4-4:2012
 Performance Criterion: B
 Repetition Frequency: 5kHz
 Burst Period: 300ms
 Test Duration: 2 minute per level & polarity

7.3.1 E.U.T. Operation

Operating Environment:

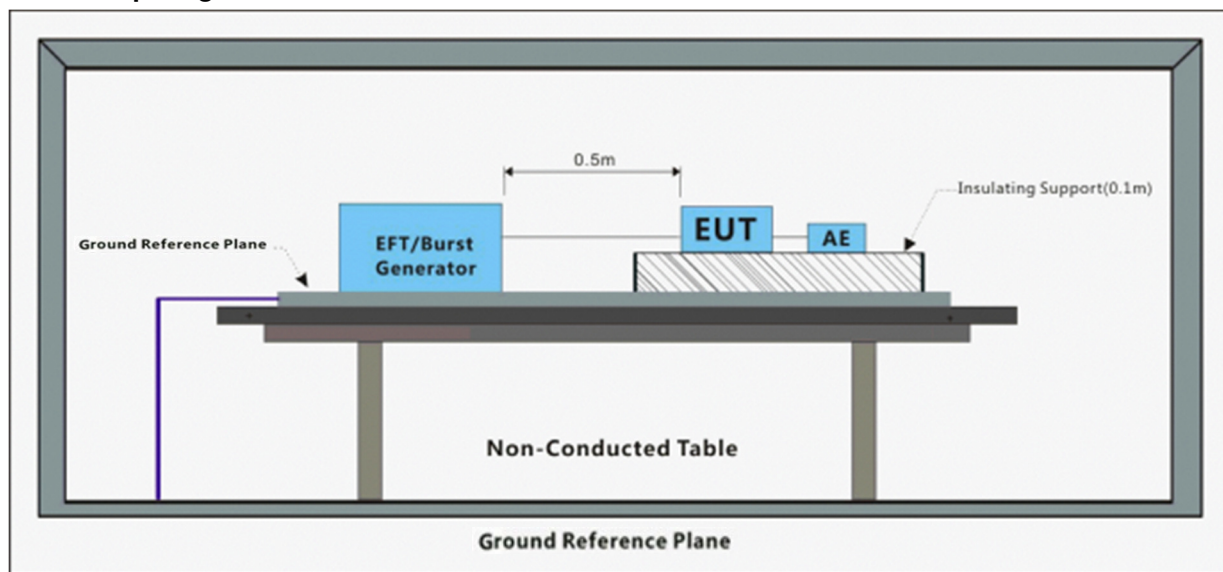
Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

a: Test the EUT in cooling mode, the thermostat shall be adjusted to the middle of the adjustment range.

Test Mode: b: Test the EUT in cooling mode, the thermostat shall be adjusted to the lowest setting.

c: Test the EUT in idle mode.

7.3.2 Test Setup Diagram



7.3.3 Test Results:

For both models

Test Line	Level (kV)	Polarity	Direct/Coupling	Result / Observations
AC power port	1	+	Direct	B
AC power port	1	-	Direct	B

Results:

B: During the experiment, LED light splash, but it could quickly recover.

7.4 Surge at Power Port

Test Requirement: EN 55014-2:2015
 Test Method: EN 61000-4-5:2014
 Performance Criterion: B
 Interval: 60s between each surge
 No. of surges: 5 positive at 90°, 5 negative at 270°.

7.4.1 E.U.T. Operation

Operating Environment:

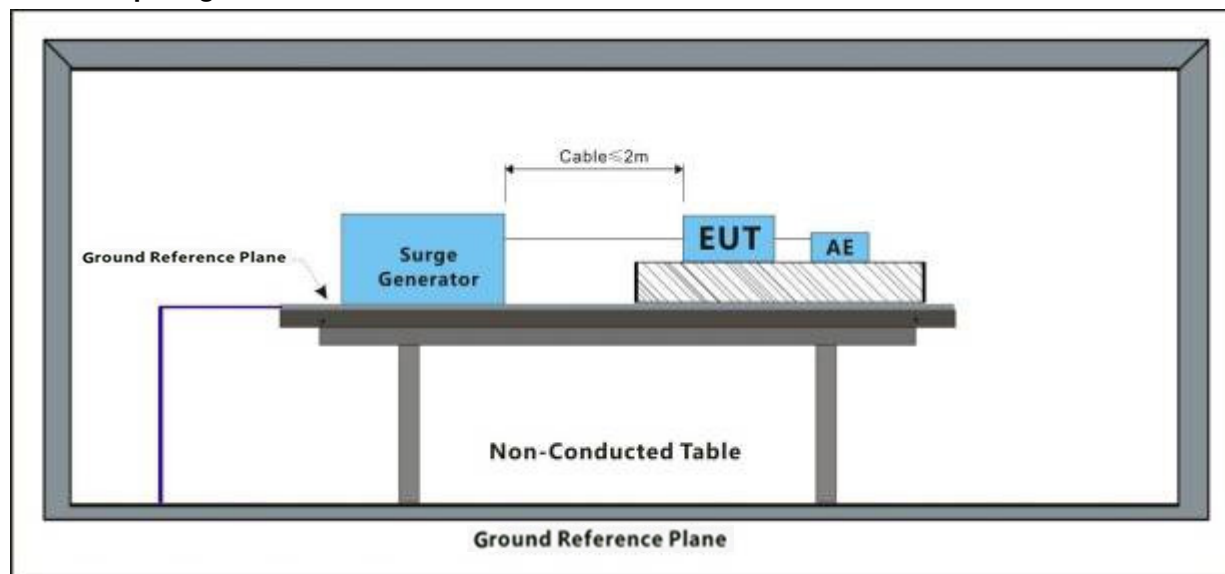
Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

a: Test the EUT in cooling mode, the thermostat shall be adjusted to the middle of the adjustment range.

Test Mode: b: Test the EUT in cooling mode, the thermostat shall be adjusted to the lowest setting.

c: Test the EUT in idle mode.

7.4.2 Test Setup Diagram



7.4.3 Test Results:

For both models

Test Line	Level (kV)	Polarity	Phase (deg)	Result / Observations
L-N	1	+	90°	A
L-N	1	-	270°	A
L-PE	2	+	90°	A
L-PE	2	-	270°	A
N-PE	2	+	90°	A
N-PE	2	-	270°	A

Results:

A: No degradation in the performance of the EUT was observed.

7.5 Conducted Immunity at Power Port (150kHz-230MHz)

Test Requirement: EN 55014-2:2015
 Test Method: EN 61000-4-6:2014
 Performance Criterion: A
 Frequency Range: 0.15MHz to 230MHz
 Modulation: 80%, 1kHz Amplitude Modulation
 Step Size: 1%

7.5.1 E.U.T. Operation

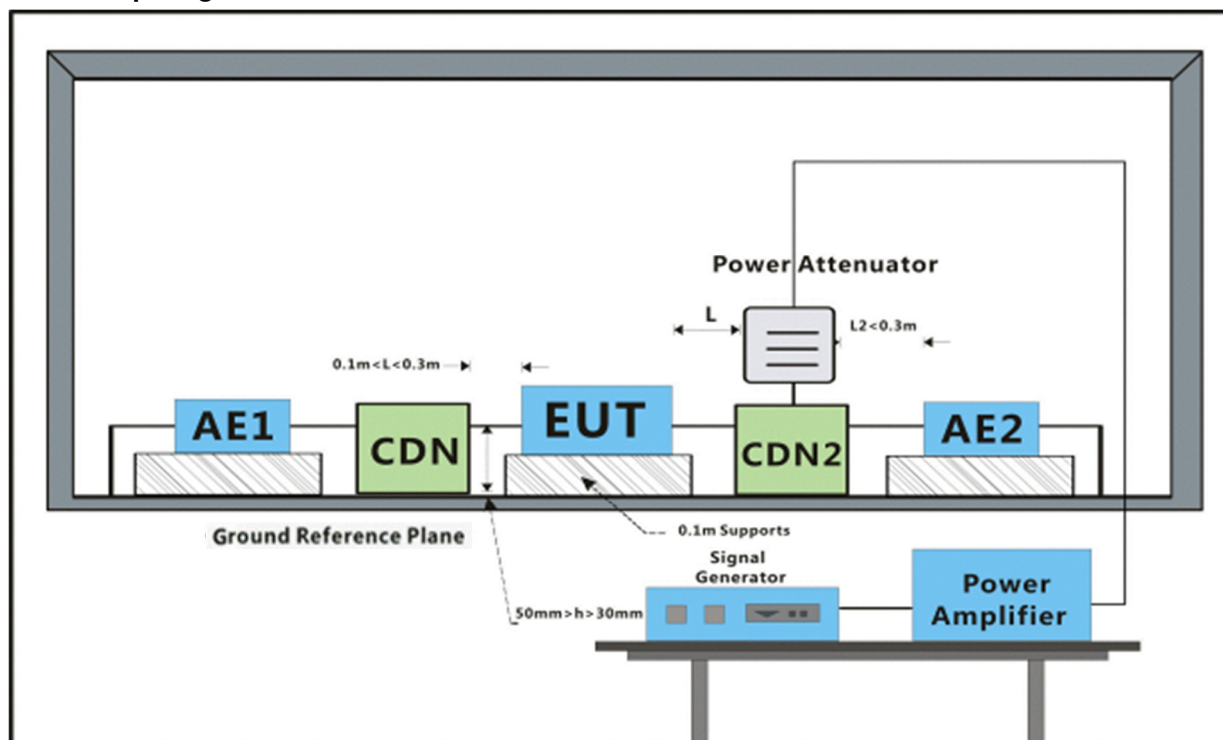
Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

a: Test the EUT in cooling mode, the thermostat shall be adjusted to the middle of the adjustment range.

Test Mode: b: Test the EUT in cooling mode, the thermostat shall be adjusted to the lowest setting.

c: Test the EUT in idle mode.

7.5.2 Test Setup Diagram**7.5.3 Test Results:**

For both models

Cable port	Level (Vrms)	Direct/Coupling	Dwell time	Result / Observations
AC power port	3	Direct	2s	A

Results:

A: No degradation in the performance of the EUT was observed.

7.6 Voltage Dips and Interruptions

Test Requirement: EN 55014-2:2015

Test Method: EN 61000-4-11:2004

Performance Criterion:

For 50Hz
 0% of UT (Supply Voltage) for 0.5 Periods: C;
 40% of UT for 10 Periods: C;
 70% of UT for 25 Periods: C

No. of Dips / Interruptions: 3 per Level

Time between dropout 10s

7.6.1 E.U.T. Operation

Operating Environment:

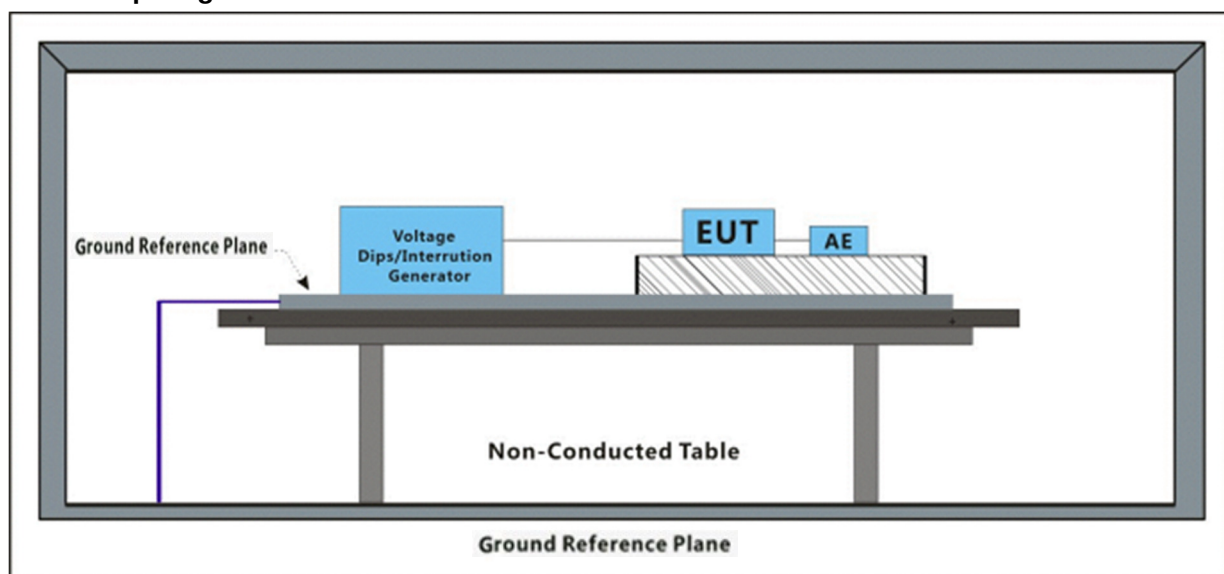
Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

a: Test the EUT in cooling mode, the thermostat shall be adjusted to the middle of the adjustment range.

Test Mode: b: Test the EUT in cooling mode, the thermostat shall be adjusted to the lowest setting.

c: Test the EUT in idle mode.

7.6.2 Test Setup Diagram





7.6.3 Test Results:

For both models

For 50Hz

Level % UT	Phase (deg)	Duration	No. of Dips / Interruptions	Result / Observations
0	0°	0.5 Periods	3	A
0	180°	0.5 Periods	3	A
40	0°	10 Periods	3	B
40	180°	10 Periods	3	B
70	0°	25 Periods	3	A
70	180°	25 Periods	3	A

Results:

A: No degradation in the performance of the EUT was observed.

B: During testing, the LED display indication was flicking, it could recover automatically after test.

8 Photographs

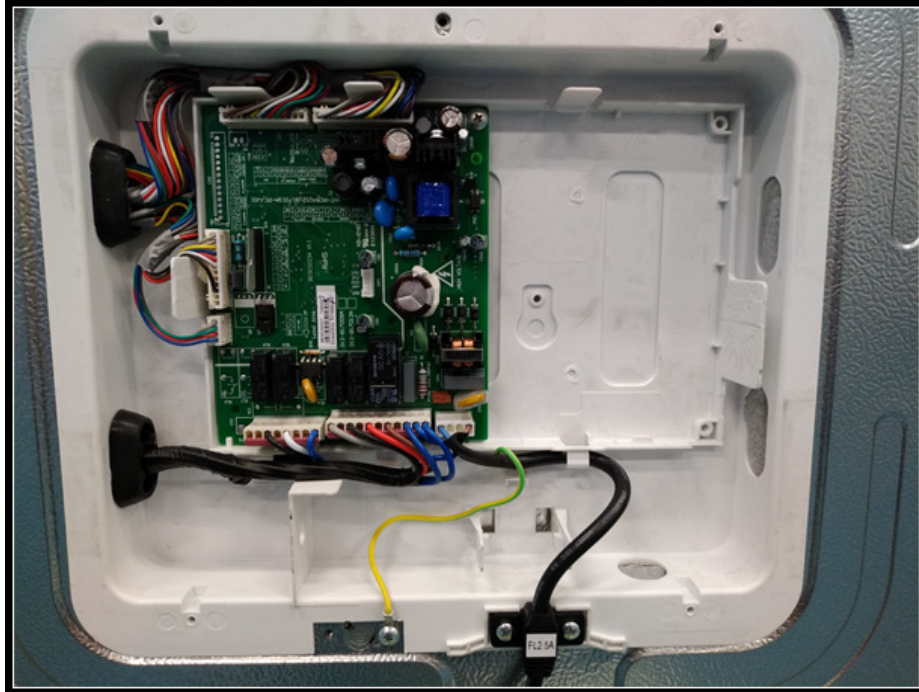
8.1 EUT Constructional Details

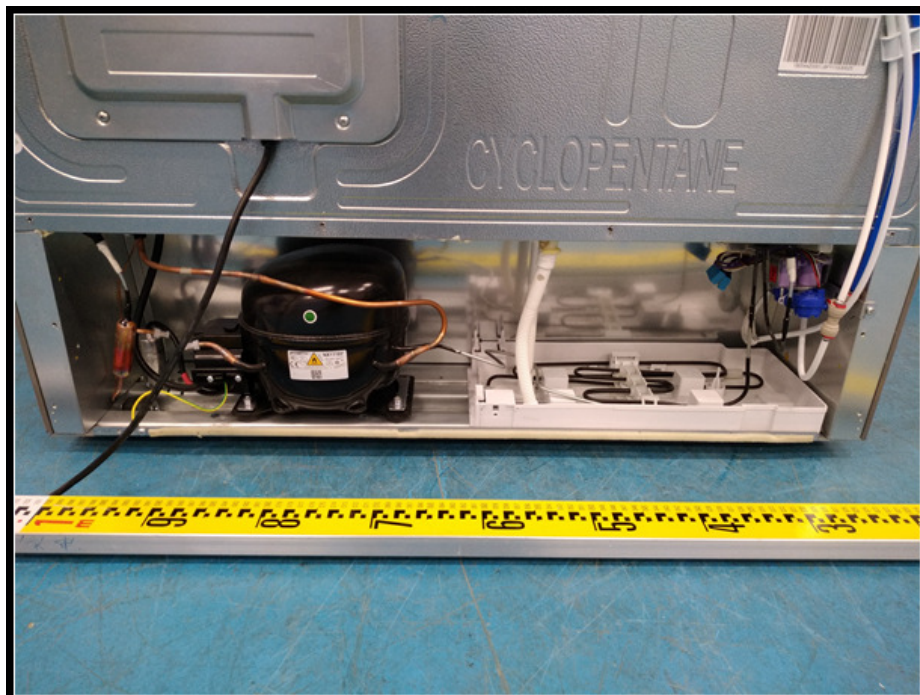
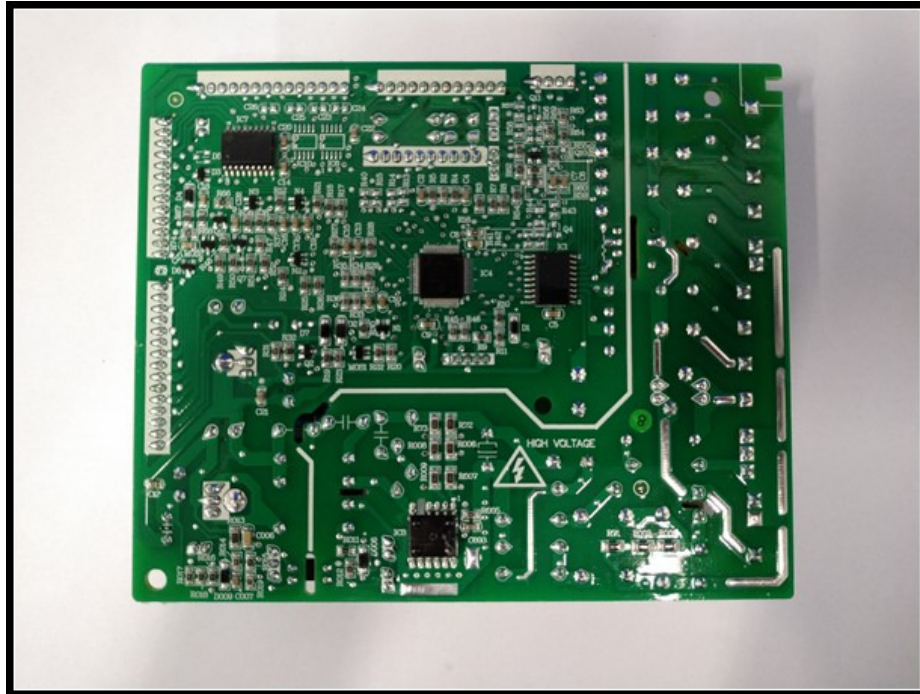
For Model RF702N4IS1













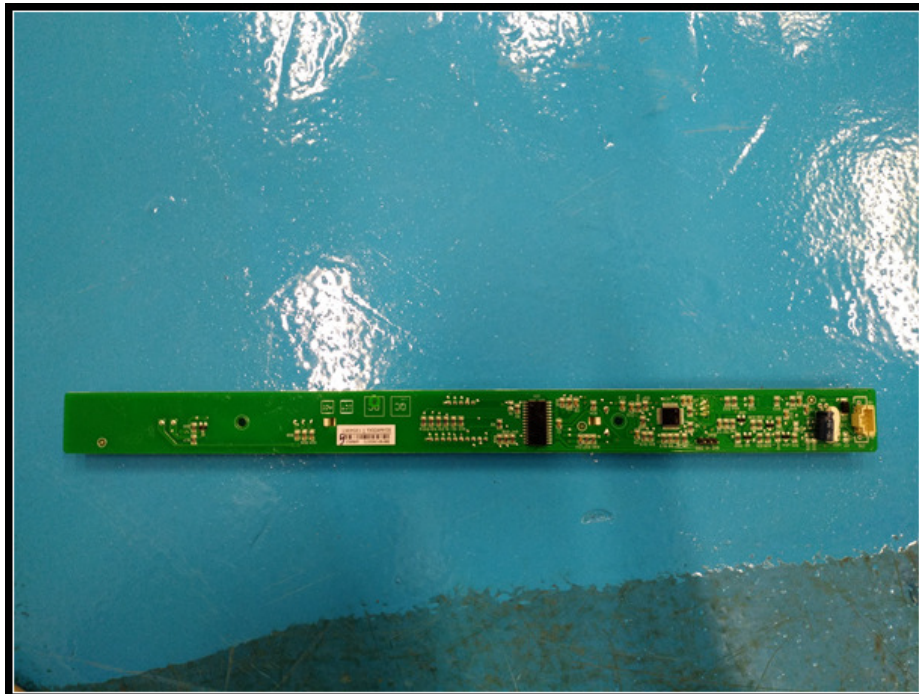
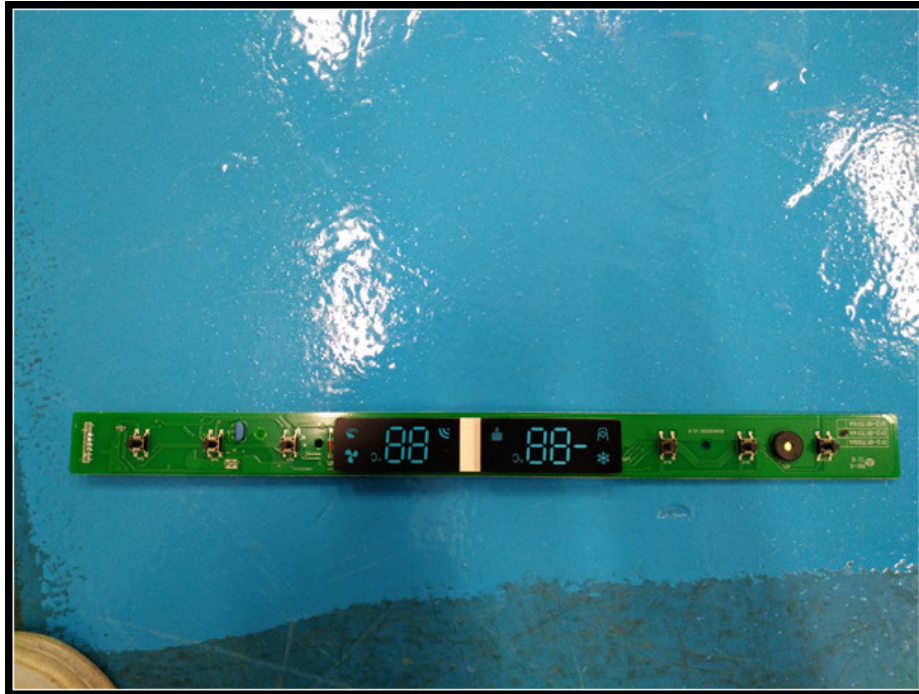










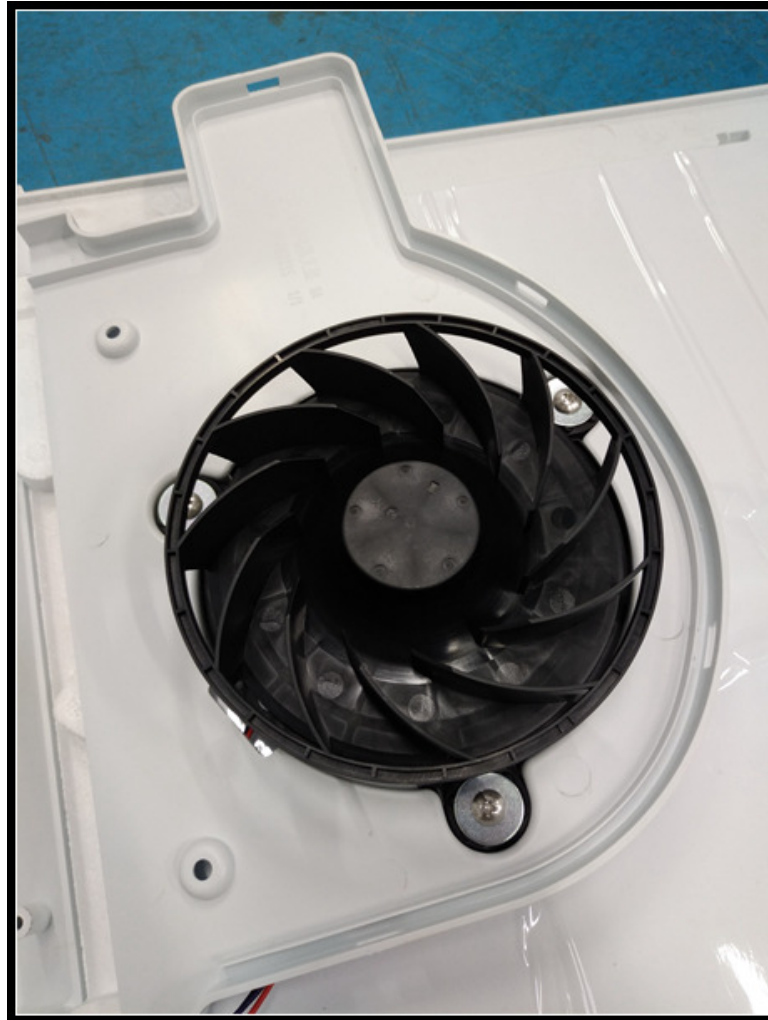
















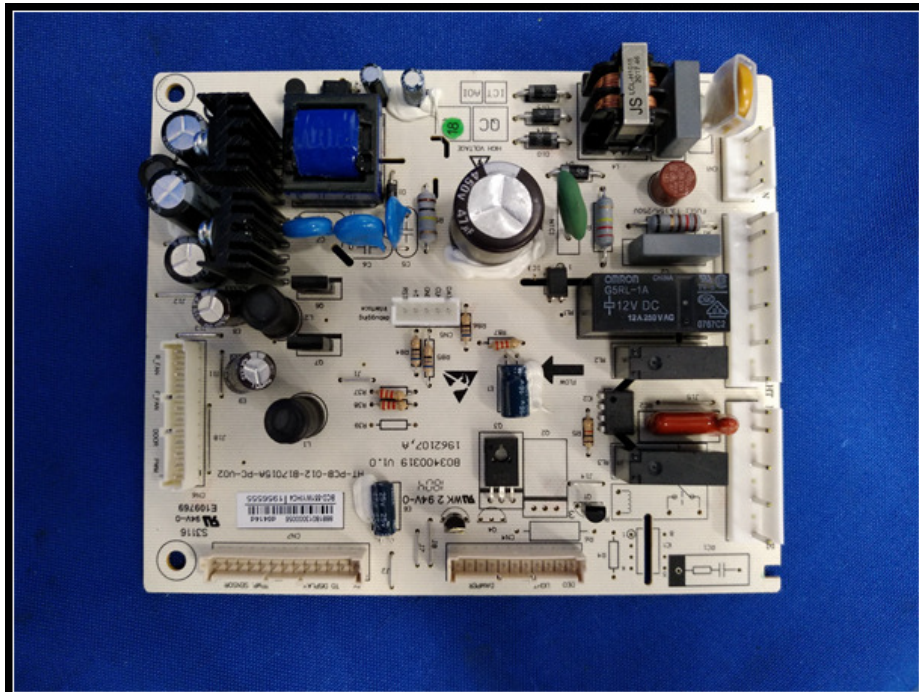
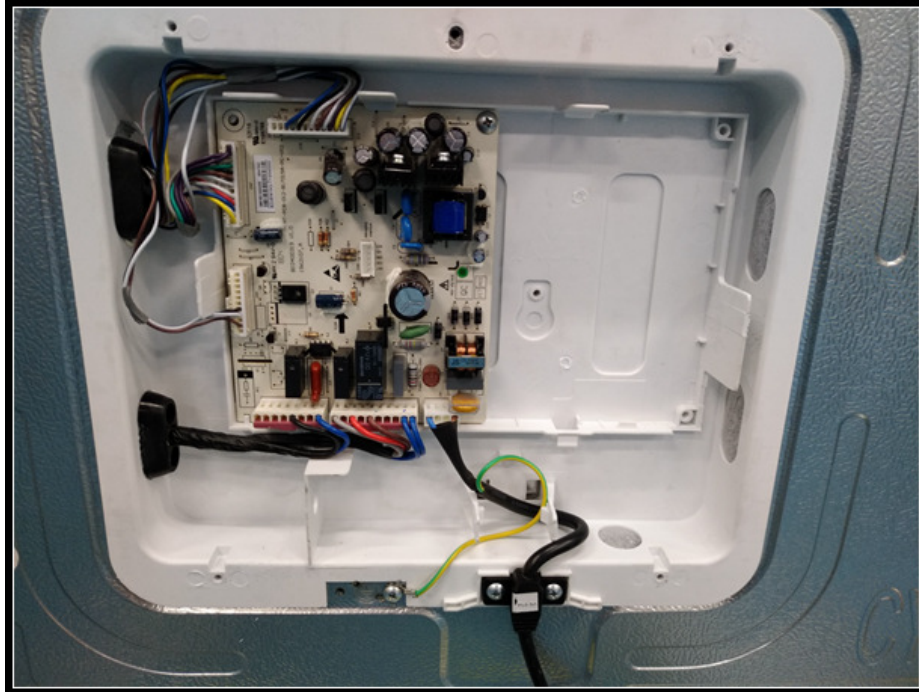


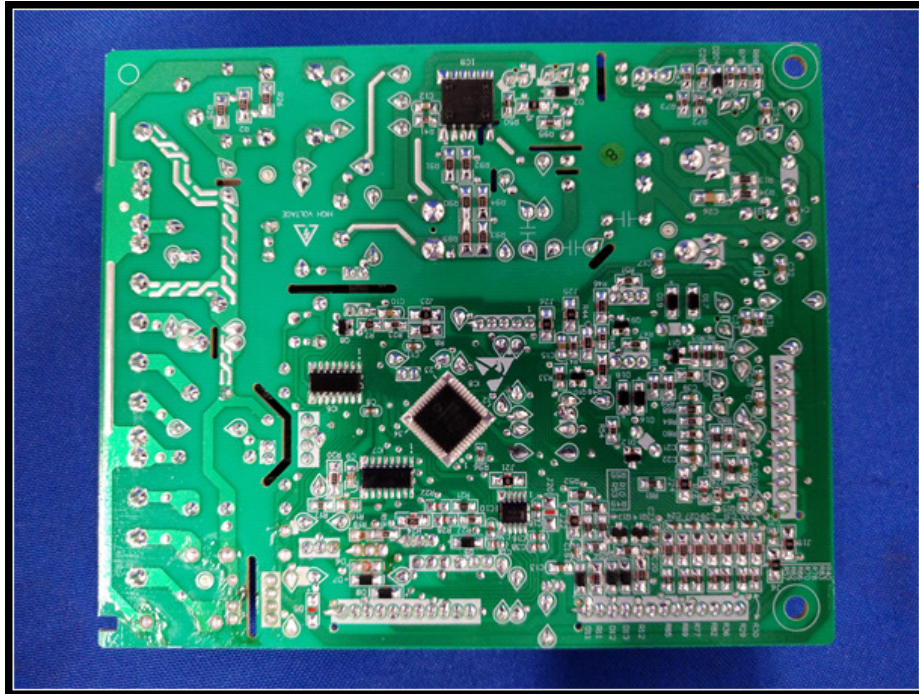
For Model RF715N4AS1











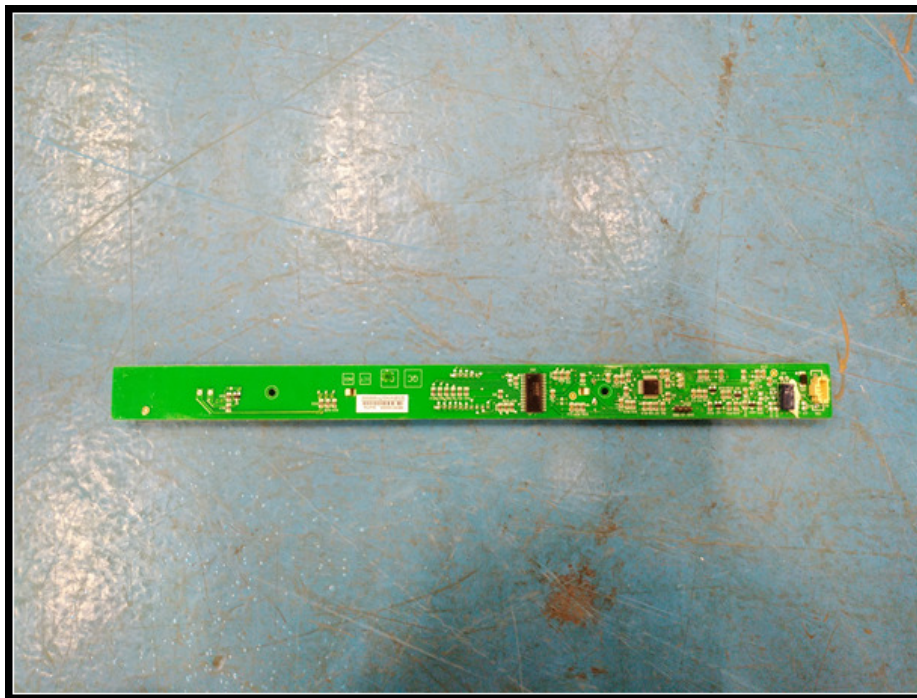












--End of Report--