Intertek Legal Entity: Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Address: Block E, No.7-2 Guang Dong Software Science Park, Caipin Road,
Guangzhou Science City, GETDD Guangzhou, China
Tel / Fax: 86-20-8213 9688/86-20-3205 7538
Website : www.intertek.com

Test Verification of Conformity

On the basis of the referenced test report(s), sample(s) of the below product have been found to comply with the harmonized standards and Directives listed on this verification at the time the tests were carried out. Other standards and Directives may be relevant to the product.

Once all product relevant CE mark directives are verified in compliance, the manufacturer may indicate compliance by signing a Declaration of Conformity themselves and applying the mark to product identical to the test sample(s) if the product complies with all relevant CE mark Directives requirements.

Applicant Name & Address:	Hisense Ronshen (Guangdong) Refrigerator Co., Ltd. No.8 Ronggang Road, Ronggui, Shunde, Foshan, Guangdong, P. R. China
Product Description:	Frost free refrigerator freezer
Ratings & Principle Characteristics:	220-240V~, 50Hz, 1.0A, class I, R600a, defrosting power: 230W, climatic class: SN, N, ST, T
Models:	RQ562N4GW1, RQ-56WC4SHA/CGA1, MKGNF440A+GW, RQ562N4AC1, RQ-56WC4SHA/CLA1, MKGNF440A+EL
Brand Name:	--
Relevant Standards/ Specifications/Directives:	EN 55014-1: 2006+A1: 2009+A2: 2011/ Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission EN 61000-3-2: 2006+ A1:2009+ A2:2009/ Electromagnetic compatibility (EMC)– Part 3-2: Limits –Limits for harmonic current emissions (equipment input current ≤ 16 A per phase) EN 61000-3-3: 2013/ Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes,voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection EN 55014-2: 1997+A1: 2001+A2: 2008/ Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 2: Immunity – Product family standard EMC Directive 2004/108/EC
Verification Issuing Office:	Same as Legal Entity
Date of Tests:	12 December 2014 to 20 December 2014
Test Report Number(s):	141212029GZU-001: 05 February 2015

Note 1: This verification is part of the full test report(s) and should be read in conjunction with them.

Signature: _____

Name: Jack Dai

Position: Sr. Project Engineer

Date: 05 February 2015

Report No.: 141212029GZU-001
Issued: 2015-02-05

TEST REPORT

Applicant Name & Address	:	Hisense Ronshen (Guangdong) Refrigerator Co., Ltd. No.8 Ronggang Road, Ronggui, Shunde, Foshan, Guangdong, P. R. China
Manufacturing Site	:	Hisense Ronshen (Yangzhou) Refrigerator Co., Ltd. No.19, Hongyang Road, Economic Development District, Yangzhou city, P.R.China
Sample Description		
Product	:	Frost free refrigerator freezer
Model No.	:	RQ562N4GW1, RQ-56WC4SHA/CGA1, MKGNF440A+GW, RQ562N4AC1, RQ-56WC4SHA/CLA1, MKGNF440A+EL
Electrical Rating	:	220-240V~, 50Hz, 1.0A, class I, R600a, defrosting power: 230W, climatic class: SN, N, ST, T
Date Received	:	12 December 2014
Date Test Conducted	:	12 December 2014 to 20 December 2014
Test standards	:	EN 55014-1: 2006+A1:2009+A2: 2011 EN 61000-3-2: 2006+ A1:2009+ A2:2009 EN 61000-3-3: 2013 EN 55014-2: 1997+A1: 2001+A2: 2008
Test Result	:	Pass
Conclusion	:	The submitted samples complied with the above EMC standards.
Remark	:	None.

**********End of Page**********

Prepared and Checked By:

Paul Pang
Engineer
Intertek Guangzhou

Approved By:

Signature

Jack Dai
Sr. Project Engineer
Intertek Guangzhou
05 February 2015 *Date*

Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD Guangzhou, China
Tel / Fax: 86-20-8213 9688/86-20-3205 7538

CONTENT

1 TEST RESULTS SUMMARY

Test Item	Standard	Result
Continuous conducted disturbance voltage	EN 55014-1: 2006+A1:2009+A2: 2011	Pass
Discontinuous conducted disturbance voltage	EN 55014-1: 2006+A1:2009+A2: 2011	Pass
Radiated disturbance power	EN 55014-1: 2006+A1:2009+A2: 2011	Pass
Radiated disturbance	EN 55014-1: 2006+A1:2009+A2: 2011 Reference: CISPR 16-2-3：2006	N/A
Harmonic of current	EN 61000-3-2: 2006+ A1: 2009+ A2: 2009	Pass
Flicker	EN 61000-3-3: 2013	Pass
ESD immunity	EN 55014-2: 1997+A1: 2001+A2: 2008 Reference: EN 61000-4-2:1995+A1:1998 +A2:2001	Pass
Radiated EM field immunity	EN 55014-2: 1997+A1: 2001+A2: 2008 Reference: EN 61000-4-3:2006+A1:2008	N/A
EFT immunity	EN 55014-2: 1997+A1: 2001+A2: 2008 Reference: EN 61000-4-4:2004	Pass
Surge immunity	EN 55014-2: 1997+A1: 2001+A2: 2008 Reference: EN 61000-4-5:2006	Pass
Inject current immunity	EN 55014-2: 1997+A1: 2001+A2: 2008 Reference: EN 61000-4-6:2007	Pass
Voltage dips and interruption immunity	EN 55014-2: 1997+A1: 2001+A2: 2008 Reference: EN 61000-4-11:2004	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.

2 EMC Results Conclusion
(with Justification)

RE: EMC Testing Pursuant to EMC Directive 2004/108/EC Performed on the Frost free refrigerator freezer, Models: RQ562N4GW1, RQ-56WC4SHA/CGA1, MKGNF440A+GW, RQ562N4AC1, RQ-56WC4SHA/CLA1, MKGNF440A+EL.

We tested the Frost free refrigerator freezer, Model: RQ562N4GW1, to determine if it was in compliance with the relevant EN standards as marked on the Test Results Summary. We found that the unit met the requirements of EN 55014-1, EN 61000-3-2, EN 61000-3-3, EN 55014-2 (EN 61000-4-2), EN 55014-2 (EN 61000-4-4), EN 55014-2 (EN 61000-4-6), EN 55014-2 (EN 61000-4-5), & EN 55014-2 (EN 61000-4-11) standards when tested as received. The worst case's test data was presented in this test report.

The appliances are refrigerators-freezer with compressor and defrost heating element intended for household indoor use.

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

3 LABORATORY MEASUREMENTS

Configuration Information

Equipment Under Test (EUT):	Frost free refrigerator freezer
Model:	RQ562N4GW1
Serial No.	Not Labeled
Support Equipment:	N/A
Rated Voltage:	220-240V~, 50Hz
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:
Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD Guangzhou, China
Except Radiated Disturbance was performed at:
Room 101, Block A, No.11 Jing Ye San Street，Yu Shu Industrial Park, Guangzhou Science City, GETDD Guangzhou

4 EMI TEST

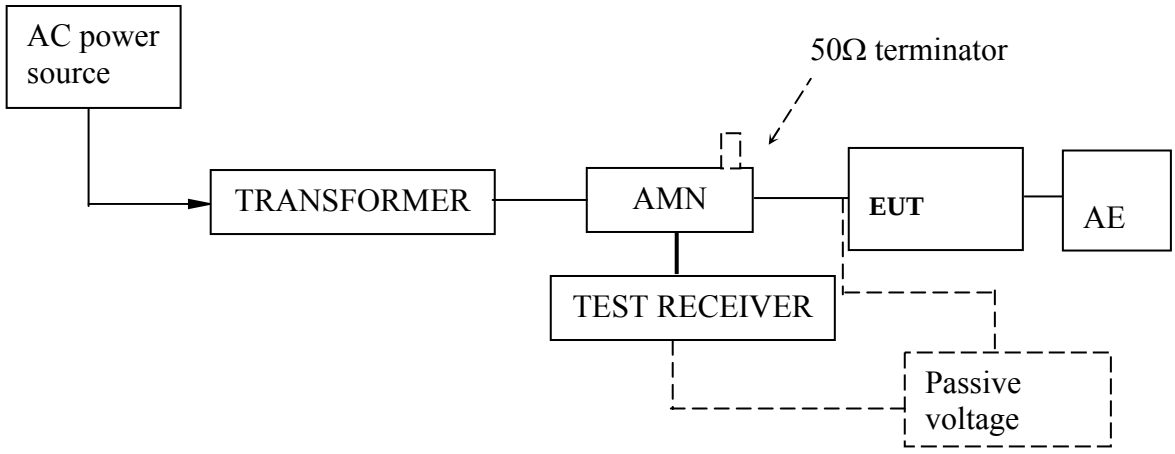
4.1 EN 55014-1 Continuous Conducted Disturbance Voltage Test

Test Result: Pass

4.1.1 Used Test Equipment

Equipment No.	Equipment	Model	Manufacturer
EM080-05	EMI receiver	ESCI	R&S
EM006-05	LISN	ENV216	R&S
EM004-04	EMC shield Room	8m×3m×3m	Zhongyu

4.1.2 Block Diagram of Test Setup



4.1.3 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 0.4m 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 0.8m 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 clause 7.

4.1.4 Test Data

At main terminal: Pass

Tested Wire: Live **Operation Mode: EUT ON**

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	CE14QP		
Trace2:	CE14AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	546 kHz	52.56 L1	-3.43
1 Quasi Peak	1.602 MHz	49.78 L1	-6.21
1 Quasi Peak	1.498 MHz	49.74 L1	-6.25
1 Quasi Peak	270 kHz	53.93 L1	-7.18
1 Quasi Peak	1.066 MHz	48.74 L1	-7.25
1 Quasi Peak	2.162 MHz	48.03 L1	-7.96
1 Quasi Peak	402 kHz	49.70 L1	-8.10
1 Quasi Peak	698 kHz	47.33 L1	-8.66
1 Quasi Peak	4.118 MHz	47.26 L1	-8.73
2 Average	546 kHz	36.71 L1	-9.28
1 Quasi Peak	4.106 MHz	46.29 L1	-9.70
2 Average	814 kHz	33.40 L1	-12.60
2 Average	682 kHz	33.27 L1	-12.73
2 Average	270 kHz	39.29 L1	-13.36
2 Average	402 kHz	34.91 L1	-13.44
2 Average	1.498 MHz	32.29 L1	-13.70
2 Average	1.638 MHz	32.09 L1	-13.90
2 Average	2.178 MHz	29.29 L1	-16.70
2 Average	4.142 MHz	29.23 L1	-16.76
2 Average	4.006 MHz	28.12 L1	-17.88

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	CE14QP		
Trace2:	CE14AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	15.53 MHz	41.19 L1	-18.80
1 Quasi Peak	9.266 MHz	40.90 L1	-19.10
1 Quasi Peak	150 kHz	46.51 L1	-19.48
1 Quasi Peak	15.246 MHz	40.07 L1	-19.92
1 Quasi Peak	6.674 MHz	36.26 L1	-23.73
1 Quasi Peak	21.666 MHz	34.85 L1	-25.14

Tested Wire: Neutral **Operation Mode: EUT ON**

EDIT PEAK LIST (Final Measurement Results)

Trace1: CE14QP
Trace2: CE14AV
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1 Quasi Peak	534 kHz	53.26	L1	-2.73
1 Quasi Peak	550 kHz	52.83	L1	-3.16
1 Quasi Peak	954 kHz	50.37	L1	-5.62
1 Quasi Peak	1.074 MHz	49.64	L1	-6.35
2 Average	538 kHz	39.47	L1	-6.52
1 Quasi Peak	806 kHz	48.69	L1	-7.31
1 Quasi Peak	1.662 MHz	48.02	L1	-7.97
1 Quasi Peak	2.166 MHz	47.80	L1	-8.19
1 Quasi Peak	274 kHz	52.69	L1	-8.29
1 Quasi Peak	1.534 MHz	47.40	L1	-8.59
2 Average	530 kHz	37.19	L1	-8.80
1 Quasi Peak	414 kHz	48.69	L1	-8.87
1 Quasi Peak	4.114 MHz	46.44	L1	-9.55
2 Average	814 kHz	35.41	L1	-10.58
2 Average	818 kHz	34.97	L1	-11.02
2 Average	406 kHz	36.67	L1	-11.57
1 Quasi Peak	2.842 MHz	44.38	L1	-11.61
2 Average	1.074 MHz	32.89	L1	-13.10
2 Average	1.502 MHz	32.07	L1	-13.92
2 Average	1.65 MHz	31.84	L1	-14.15

EDIT PEAK LIST (Final Measurement Results)

Trace1: CE14QP
Trace2: CE14AV
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
2 Average	266 kHz	38.29	L1	-14.51
1 Quasi Peak	4.706 MHz	39.95	L1	-16.04
2 Average	2.154 MHz	29.11	L1	-16.88
1 Quasi Peak	3.21 MHz	39.06	L1	-16.93
2 Average	4.142 MHz	28.91	L1	-17.08
1 Quasi Peak	150 kHz	47.50	L1	-18.49
2 Average	2.818 MHz	26.61	L1	-19.38
1 Quasi Peak	286 kHz	41.23	L1	-19.40
1 Quasi Peak	16.062 MHz	39.88	L1	-20.11
1 Quasi Peak	14.97 MHz	38.86	L1	-21.13
2 Average	3.586 MHz	24.62	L1	-21.37
1 Quasi Peak	9.626 MHz	37.97	L1	-22.02
1 Quasi Peak	10.474 MHz	37.13	L1	-22.86
1 Quasi Peak	21.498 MHz	36.19	L1	-23.80
1 Quasi Peak	6.502 MHz	34.65	L1	-25.34
1 Quasi Peak	24.51 MHz	32.56	L1	-27.43
1 Quasi Peak	202 kHz	35.69	L1	-27.83
1 Quasi Peak	7.882 MHz	21.73	L1	-38.26

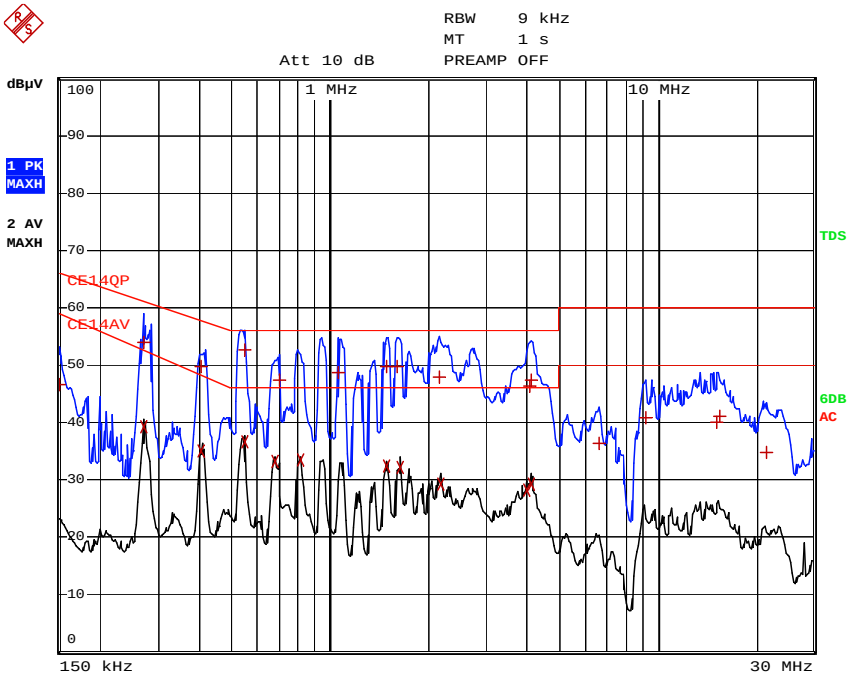
At load/control terminal: Not Applicable

Frequency	Quasi-Peak		Average	
[MHz]	Disturbance level [dB(µV)]	Permitted limit [dB(µV)]	Disturbance level [dB(µV)]	Permitted limit [dB(µV)]
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--
--	--	--	--	--

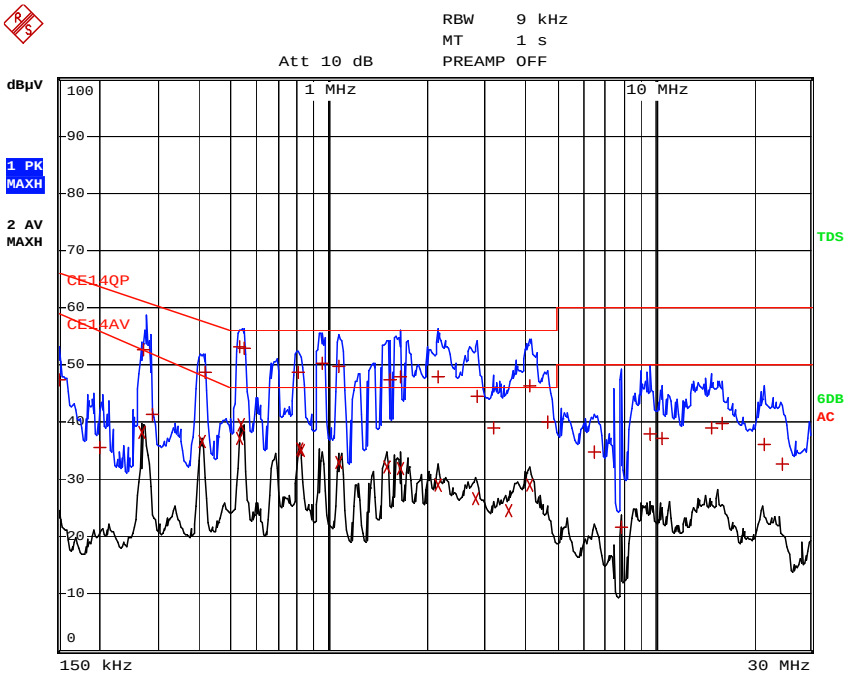
4.1.5 Emission Curve

At mains terminal:

Tested Wire: Live



Tested Wire: Neutral



At load/control terminal:

Not Applicable.

4.1.6 Measurement Uncertainty

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 CISPR 16-4-2: 2003.
Measurement uncertainty of mains terminal disturbance voltage in CISPR band B: 2.58 dB.
The measurement uncertainty is given with a confidence of 95%, k=2.

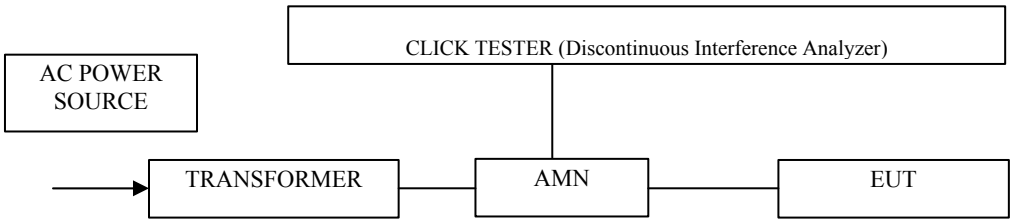
4.2 EN 55014-1 Discontinuous Conducted Disturbance Voltage

Test Result: Pass

4.2.1 Used Test Equipment

Equipment No.	Equipment	Model	Manufacturer
EM008-01	Click Tester	DIA1512D	SCHAFFNER
EM006-06	LISN	ENV216	R&S
EM004-03	EMC shield Room	8m×4m×3m	Zhongyu

4.2.2 Block Diagram of Test Setup



4.2.3 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 were 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 clause 7.

4.2.4 Test Data

First test run:

Frequency (MHz)	0.15	0.50	1.40	30.00
Permitted limit for continuous interference (dBµV)	66	56	56	60
Short Clicks [T<10ms]	1	7	5	0
Mid. Clicks [10ms<T<20ms]	0	0	0	0
Long Clicks [T>20ms]	34	11	0	0
Total clicks (number)	35	18	5	0
Switching operation (number)	2			
Factor	0.5			
Observation time (min.)	120			
Click rate, N	0.01	0.01	0.01	0.01
Value to be added (dB)	44	44	44	44
Counted clicks allowed to exceed the permitted limit (number)	8	4	1	0

Second test run:

Permitted limit for clicks (dBµV)	110	100	100	104
Counted clicks exceeding the limit (number)	0	0	0	0
Complies with the limit (Pass/Fail)	Pass	Pass	Pass	Pass

4.2.5 Measurement Uncertainty

The measurement uncertainty for click test is under consideration according to CISPR 16-4-2:2003.

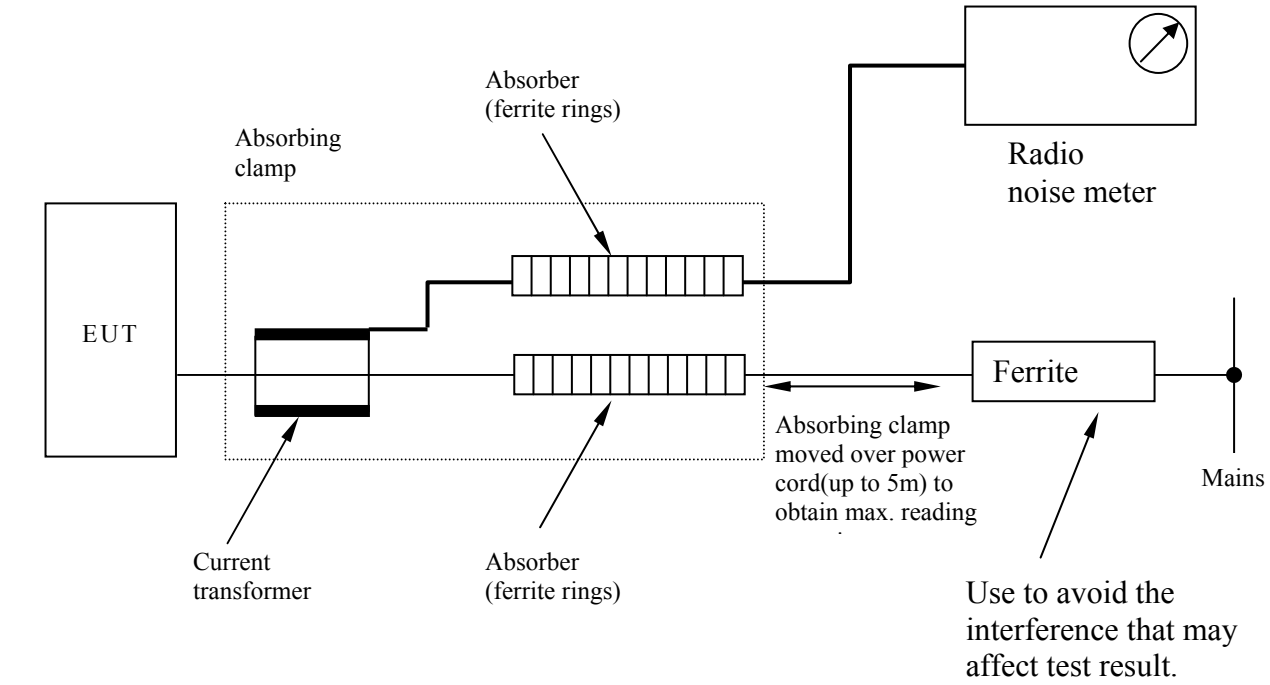
4.3 EN 55014-1 Radiated Disturbance Power

Test Result: Pass

4.3.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM080-05	EMI receiver	ESCI	R&S
EM081-04	Absorb Power Clamp	MDS-21	R&S
EM004-04	EMC shield Room	8m×3m×3m	Zhongyu

4.3.2 Block Diagram of Test Setup



Note: ——— : power line

——— : signal lime

4.3.3 Test Setup and Procedure

The disturbance power was measured with the EUT in a shielded room. The height of the table shall be 0,1 m ± 0,025 m for appliances primarily intended to be positioned on the floor in normal use, and 0,8 m ± 0,05 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 clause 7.

4.3.4 Test Data

Tested Port: AC Mains **Operation mode: EUT ON**

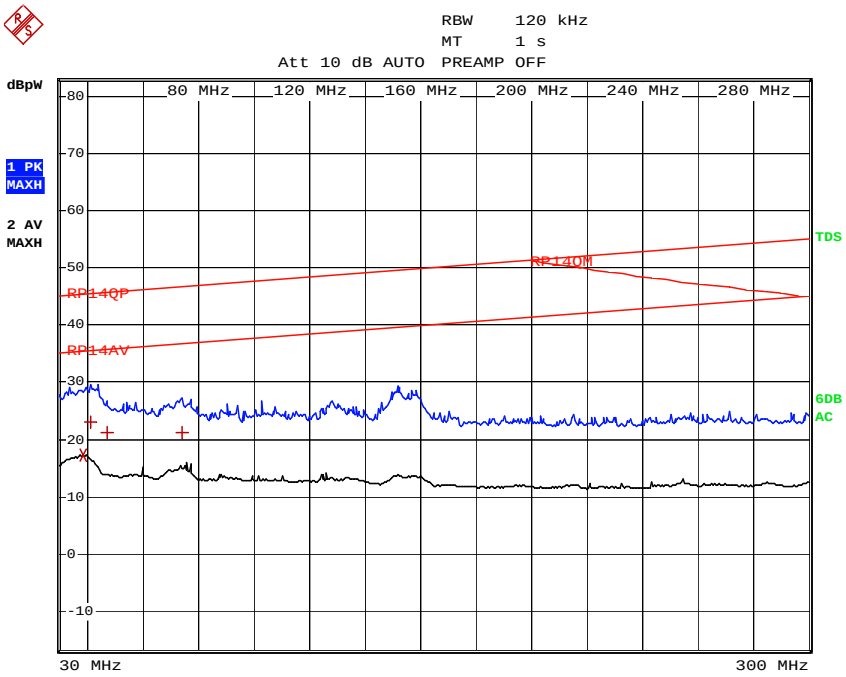
EDIT PEAK LIST (Final Measurement Results)

Trace1: RP14QP
Trace2: RP14AV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBpW		DELTA LIMIT dB
2	Average	38.4 MHz	17.20	L1	-18.10
1	Quasi Peak	41.08 MHz	22.97	L1	-22.44
1	Quasi Peak	47.44 MHz	21.10	L1	-24.54
1	Quasi Peak	74 MHz	21.31	L1	-25.31

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

4.3.5 Test Curve



4.3.6 Measurement Uncertainty

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 CISPR 16-4-2: 2003.
Measurement uncertainty of mains terminal disturbance power: 3.13 dB
The measurement uncertainty is given with a confidence of 95%, k=2.

4.4 EN 55014-1 Radiated Disturbance

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,.

☐ Radiated disturbance (300-1000MHz) shall be conducted, if the measurement quasi-peak data of disturbance power is between the limit and limit reduced by the margin (0 to 10dB) at frequency range 200 to 300 MHz or the maximum clock frequency is not less than 30MHz,.

☐Radiated disturbance(30-1000MHz) is applied to battery-operated appliance

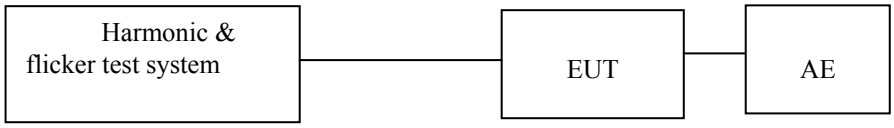
5 Harmonic of Current

Test Result: Pass

5.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM001-02	Harmonic & Flicker Test System	5001IX-CTS-400-413	California Instrument

5.2 Block Diagram of Test Setup



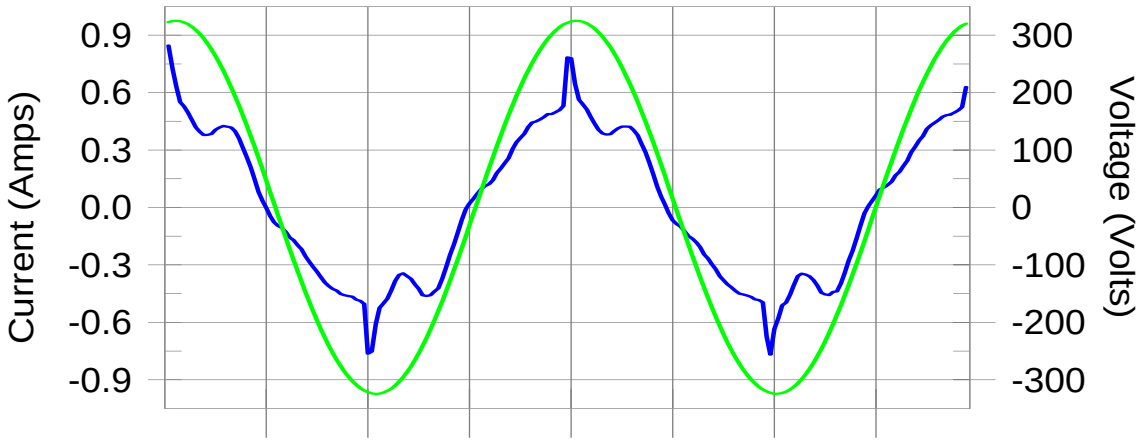
5.3 Test Setup and Procedure

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.

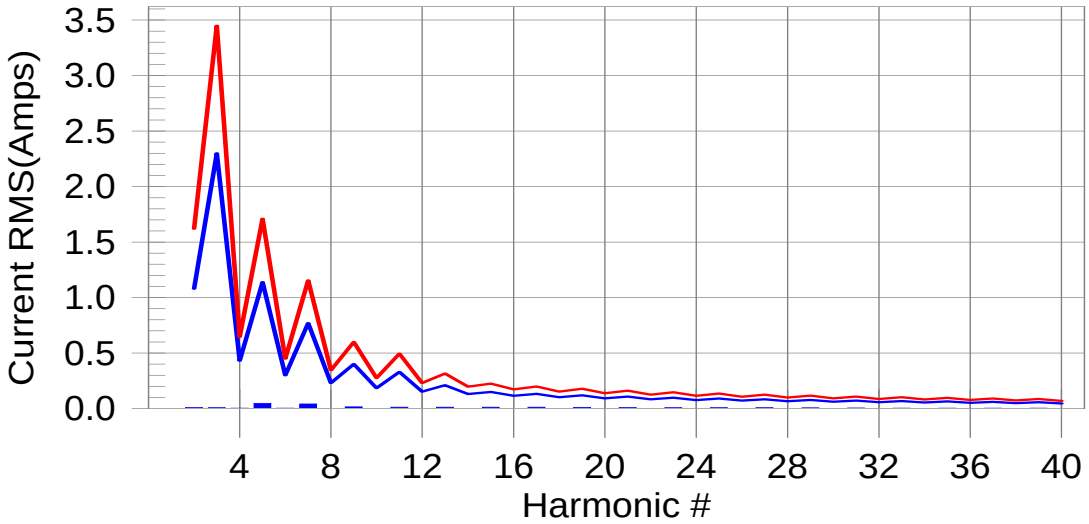
5.4 Test Data

Harmonics – Class-A per Ed. 3.0 (incl. inter-harmonics)

Current & voltage waveforms



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



Test result: Pass Worst harmonic was #21 with 9.32% of the limit.

Current Test Result Summary (Run time)

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

Highest parameter values during test:

V_RMS (Volts):	**230.07**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**0.897**	**I_RMS (Amps):**	**0.398**
I_Fund (Amps):	**0.389**	**Crest Factor:**	**2.422**
Power (Watts):	**89.3**	**Power Factor:**	**0.983**

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.009	1.080	0.9	0.010	1.620	0.60	Pass
3	0.006	2.300	0.3	0.008	3.450	0.22	Pass
4	0.004	0.430	0.0	0.004	0.645	0.65	Pass
5	0.045	1.140	4.0	0.047	1.710	2.77	Pass
6	0.003	0.300	0.0	0.004	0.450	0.82	Pass
7	0.040	0.770	5.2	0.042	1.155	3.59	Pass
8	0.001	0.230	0.0	0.001	0.345	0.43	Pass
9	0.015	0.400	3.8	0.016	0.600	2.60	Pass
10	0.001	0.184	0.0	0.001	0.276	0.45	Pass
11	0.012	0.330	3.7	0.013	0.495	2.56	Pass
12	0.001	0.153	0.0	0.001	0.230	0.45	Pass
13	0.011	0.210	5.2	0.011	0.315	3.65	Pass
14	0.001	0.131	0.0	0.001	0.197	0.44	Pass
15	0.012	0.150	7.7	0.012	0.225	5.39	Pass
16	0.001	0.115	0.0	0.001	0.173	0.47	Pass
17	0.011	0.132	8.7	0.012	0.199	5.95	Pass
18	0.001	0.102	0.0	0.001	0.153	0.54	Pass
19	0.011	0.118	9.1	0.011	0.178	6.25	Pass
20	0.001	0.092	0.0	0.001	0.138	0.64	Pass
21	0.010	0.107	9.3	0.010	0.161	6.37	Pass
22	0.001	0.084	0.0	0.001	0.125	0.74	Pass
23	0.009	0.098	9.2	0.009	0.147	6.27	Pass
24	0.001	0.077	0.0	0.001	0.115	0.86	Pass
25	0.008	0.090	9.0	0.008	0.135	6.12	Pass
26	0.001	0.071	0.0	0.001	0.106	0.95	Pass
27	0.007	0.083	8.6	0.007	0.125	5.84	Pass
28	0.001	0.066	0.0	0.001	0.099	1.08	Pass
29	0.006	0.078	8.0	0.006	0.116	5.52	Pass
30	0.001	0.061	0.0	0.001	0.092	1.16	Pass
31	0.005	0.073	7.5	0.006	0.109	5.18	Pass
32	0.001	0.058	0.0	0.001	0.086	1.29	Pass
33	0.005	0.068	0.0	0.005	0.102	4.79	Pass
34	0.001	0.054	0.0	0.001	0.081	1.33	Pass
35	0.004	0.064	0.0	0.004	0.096	4.48	Pass
36	0.001	0.051	0.0	0.001	0.077	1.40	Pass
37	0.004	0.061	0.0	0.004	0.091	4.06	Pass
38	0.001	0.048	0.0	0.001	0.073	1.41	Pass
39	0.003	0.058	0.0	0.003	0.087	3.76	Pass
40	0.001	0.046	0.0	0.001	0.069	1.36	Pass

5.5 Measurement Uncertainty

The measurement uncertainty for harmonic test is under consideration according to CISPR 16-4-2:2003.

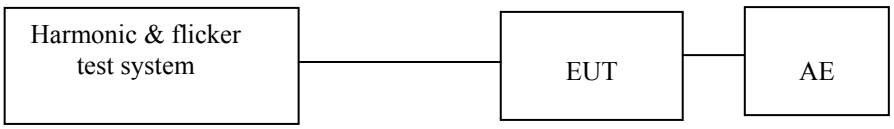
6 Flicker

Test Result: Pass

6.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM001-02	Harmonic & Flicker Test System	5001IX-CTS-400-413	California Instrument

6.2 Block Diagram of Test Setup



6.3 Test Setup and Procedure

6.3.1 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

6.3.2 Test condition

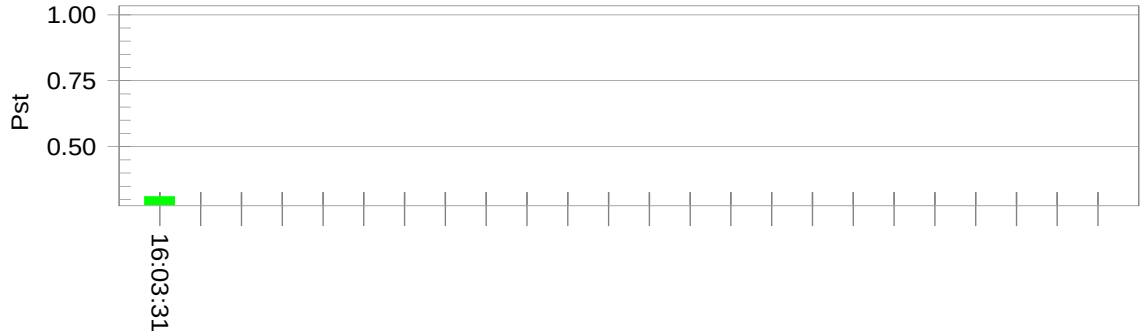
The EUT was set to produce the most unfavourable sequence of voltage changes.

6.4 Test Data

Flicker Test Summary (Run time)

Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**229.62**			
Highest dt (%):	**0.99**	**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 (%):	**1.97**	**Test limit (%):**	**6.00**	**Pass**
Highest Pst (10 min. period):	**0.310**	**Test limit:**	**1.000**	**Pass**

6.5 Measurement Uncertainty

Measurement uncertainty for voltage fluctuation and flicker is under consideration according to CISPR 16-4-2:2003.

7 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.

Measurement Uncertainty
According to CISPR 16-4-2:2003, measurement uncertainty to immunity test is under consideration.

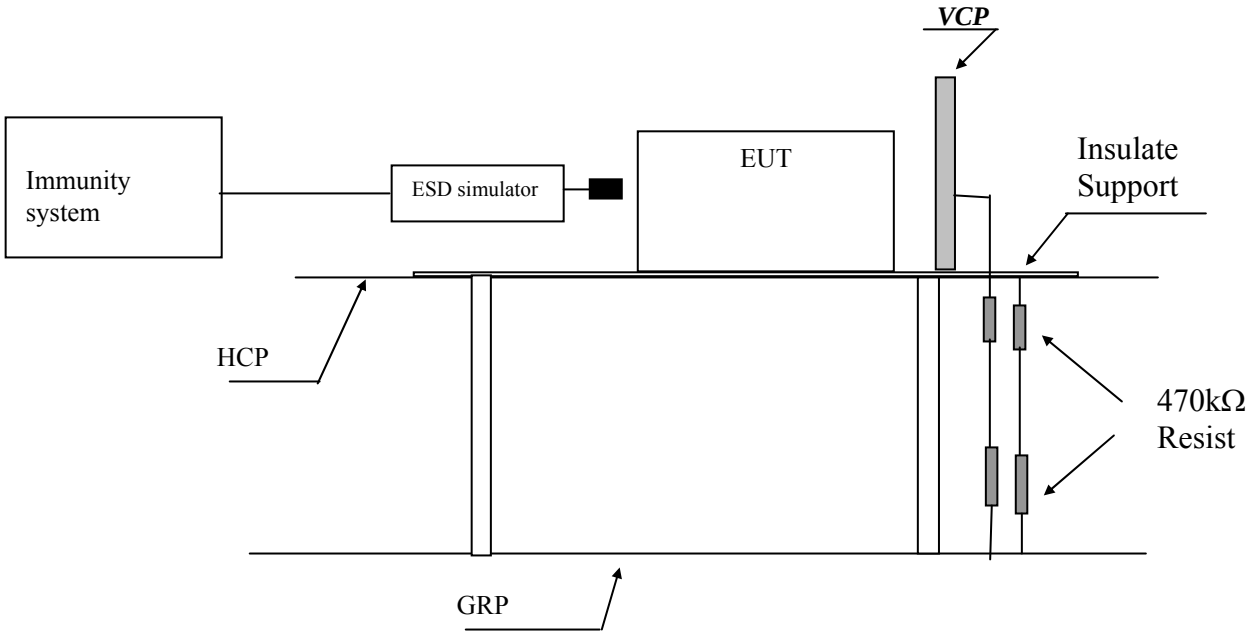
7.1 EN 61000-4-2(Pursuant to EN 55014-2) Electrostatic Discharge Immunity

Performance criterion: B
Test Result: Pass

7.1.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM077-04	ESD Simulator	NSG437	TESEQ

7.1.2 Block Diagram of Test Setup



Note: HCP means Horizontal Coupling Plane,
VCP means Vertical Coupling Plane
GRP means Ground Reference Plane

7.1.3 Test Setup and Procedure

The EUT was put on a 0.8m high wooden tabel/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 & thinkmess 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 was applied only to those points and surface which are accessible to personnel during normal usage.

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

The ESD generator was held perpendicular to the surface to which the discharge is applied. The discharge return cable of the generator was kept at a distance of 0.2m whilst the discharge is being applied. During the contact discharges, the tip of the discharge electrode was touch the EUT before the discharge switch is 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 dischares 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 is 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.

10 times of each polarity single discharge were applied to HCP and VCP. The detail selected points are listed in the following table.

7.1.4 Test Result

Direct Application of ESD

Direct Contact Discharge

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

Vertical Coupling Plane beside the EUT

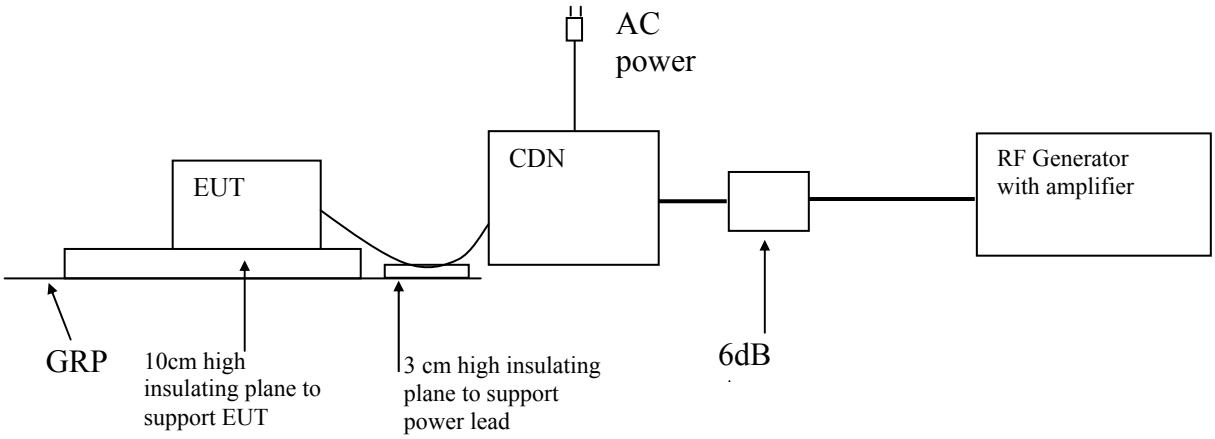
Applied Voltage (kV)	No. of Discharge for each point	Result (pursuant to EN 55014-2 criterion B)	Discharged Point
4	20	Pass	The centre of the vertical edge of the coupling plane

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

Performance criterion: A
Test Result: Pass

7.2.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM019-01	Conducted Immunity Testing System	NSG4070-75	Teseq GmbH
EM019-01-02	Coupling&Decoupling Network	CDNM016	Teseq GmbH
EM019-01-03	6dB Attenuator	ATN6075	Teseq GmbH



7.2.2 Block Diagram of Test Setup

7.2.3 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.

7.2.4 Test Result

Port:	Frequency (MHz)	Level (Pursuant to EN55014-2)	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

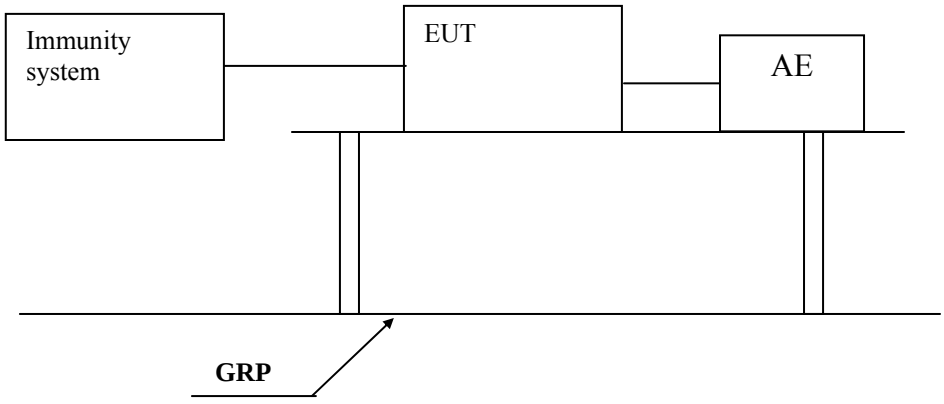
7.3 EN 61000-4-4(Pursuant to EN 55014-2) Electrical Fast Transient/Burst

Performance criterion: B
Test Result: Pass

7.3.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM005-07	EMS test system	Ecompact 4	HAEFELY

7.3.2 Block Diagram of Test Setup



7.3.3 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 is greater than 0.5m.

The mains lead excess than 0.5m is 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 were 0.5m.

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

7.3.4 Test Result

Level (Pursuant to EN55014-2)	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

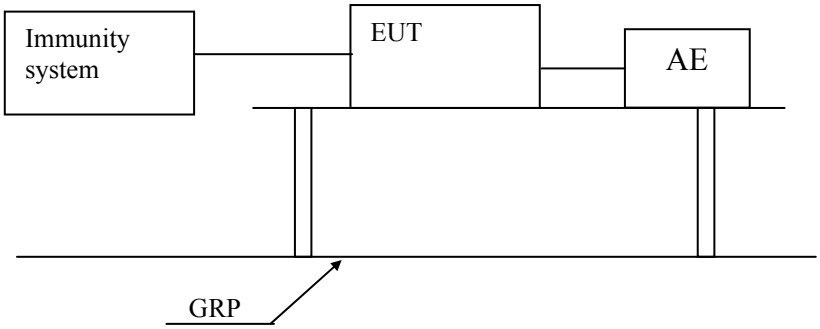
7.4 EN 61000-4-5(Pursuant to EN 55014-2) Surge Immunity

Performance criterion: B
Test Result: Pass

7.4.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM005-09	Surge/DIP Generator	NSG3040	TESEQ

7.4.2 Block Diagram of Test Setup



7.4.3 Test Setup and Procedure

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

Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines and to provide sufficient decoupling impedance to the surge wave so that the specified wave may 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 and the power cord between the EUT and the coupling/decoupling network was less than 2 meters.

Surge is applied to the EUT power supply terminals.

7.4.4 Test Result

Level (Pursuant to EN 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

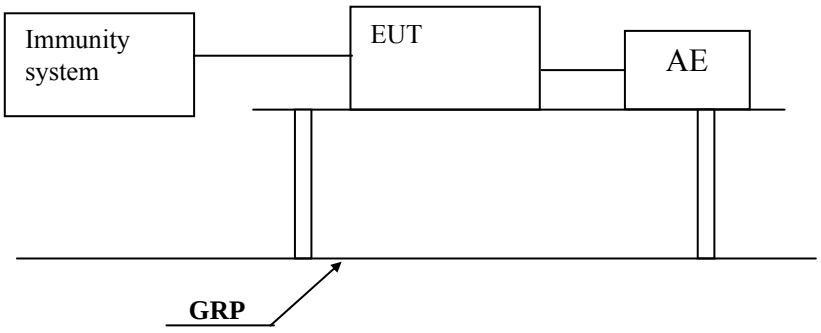
7.5 EN 61000-4-11(Pursuant to EN 55014-2) Voltage Dips and Interruptions

Performance criterion: C
Test Result: Pass

7.5.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM005-07	EMS test system	Ecompact 4	HAEFELY

7.5.2 Block Diagram of Test Setup



7.5.3 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.

7.5.4 Test Result

Test condition (Pursuant to EN 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: U_T is the rated voltage for the equipment.

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

Performance criterion: A

Test Result: Not Applicable

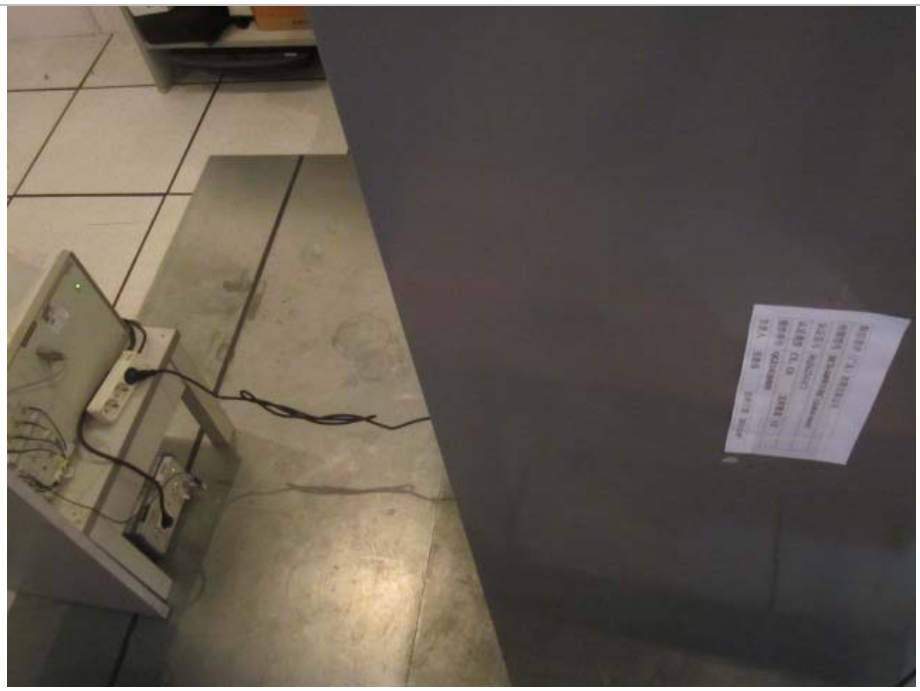
Remark:

Containing electronic control circuitry with no internal clock frequency or oscillator frequency higher than 15 MHz.

8 Appendix I - Photos of test setup

Conducted Emission

Radiated Power

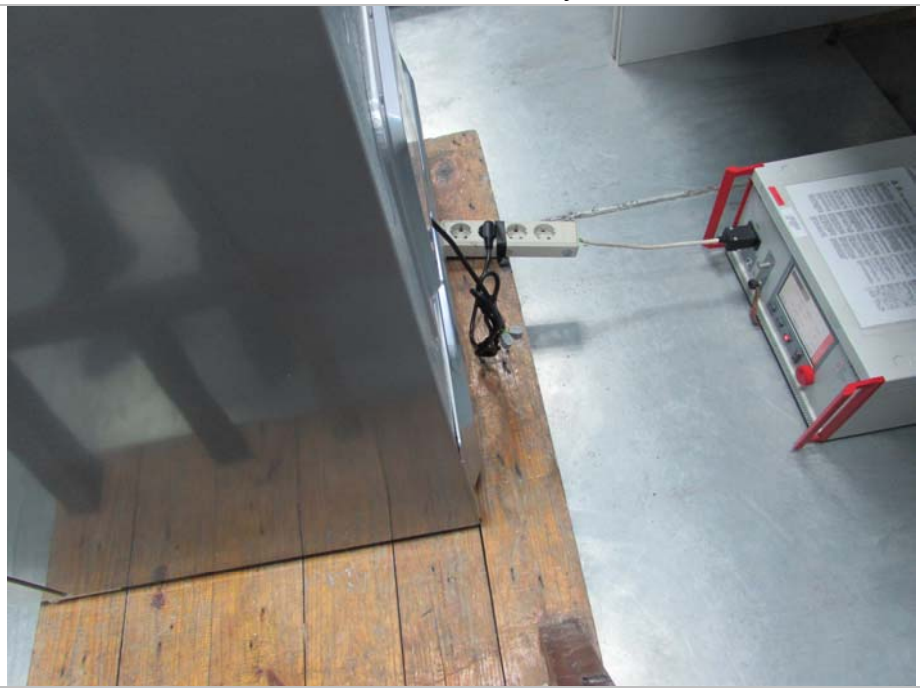
Clicks

Harmonics and Flicker


ESD Immunity

EFT / DIP Immunity


Conducted Immunity

SURGE Immunity



9 Appendix II - Photos of EUT

Front view of RQ562N4GW1, RQ-56WC4SHA/CGA1 and MKGNF440A+GW
(Front door panel material: glass)

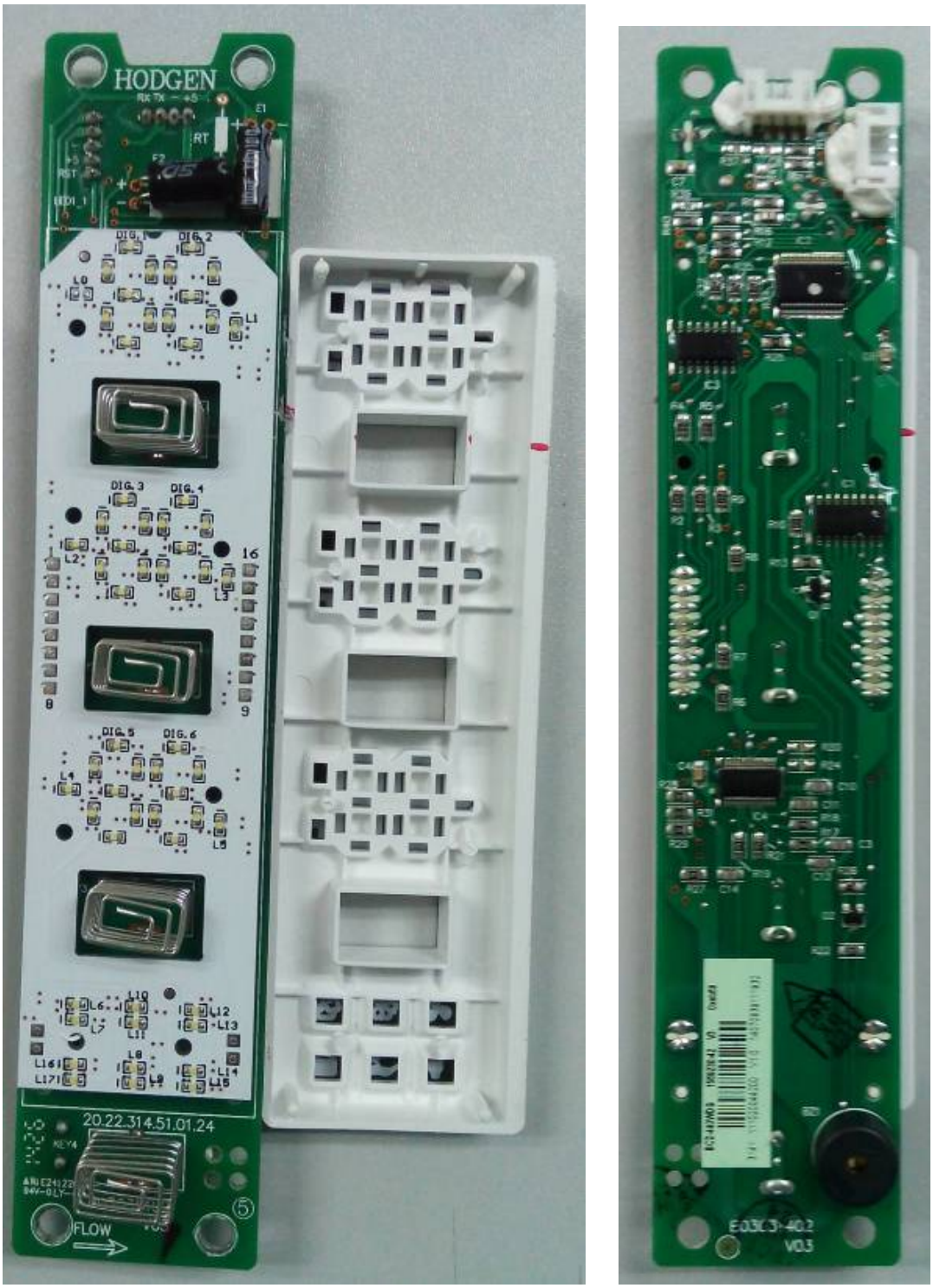
Front view of RQ562N4AC1, RQ-56WC4SHA/CLA1 and MKGNF440A+EL
(Front door panel material: metal)

Internal view

Back view

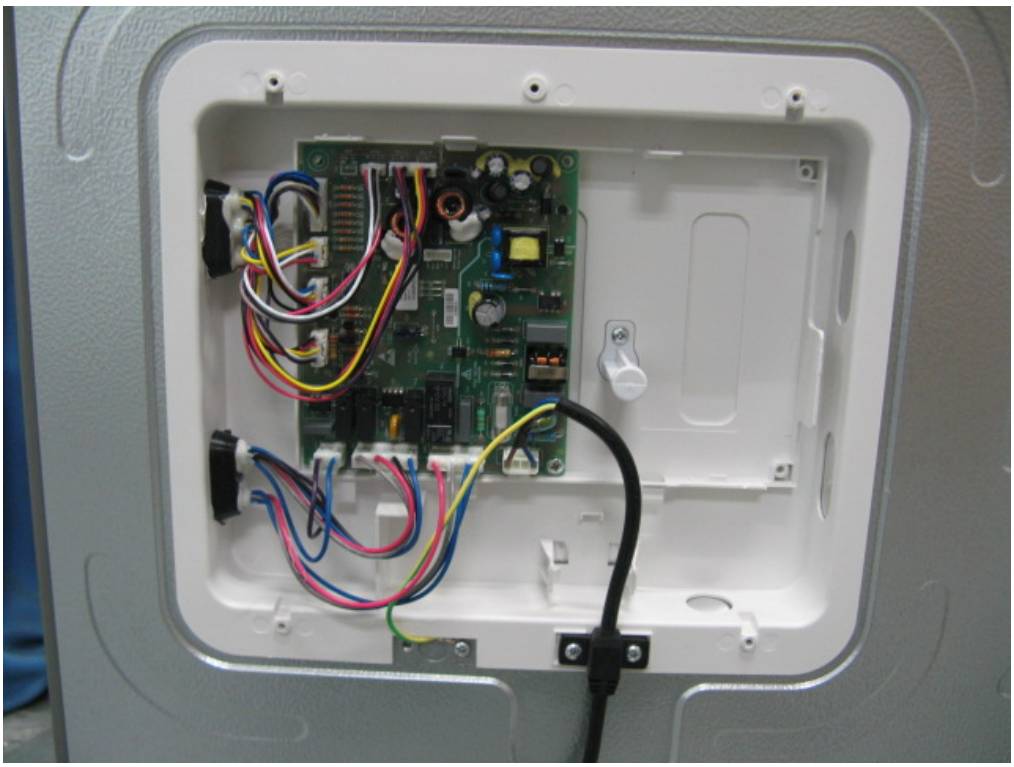
View of control panel

View of display board

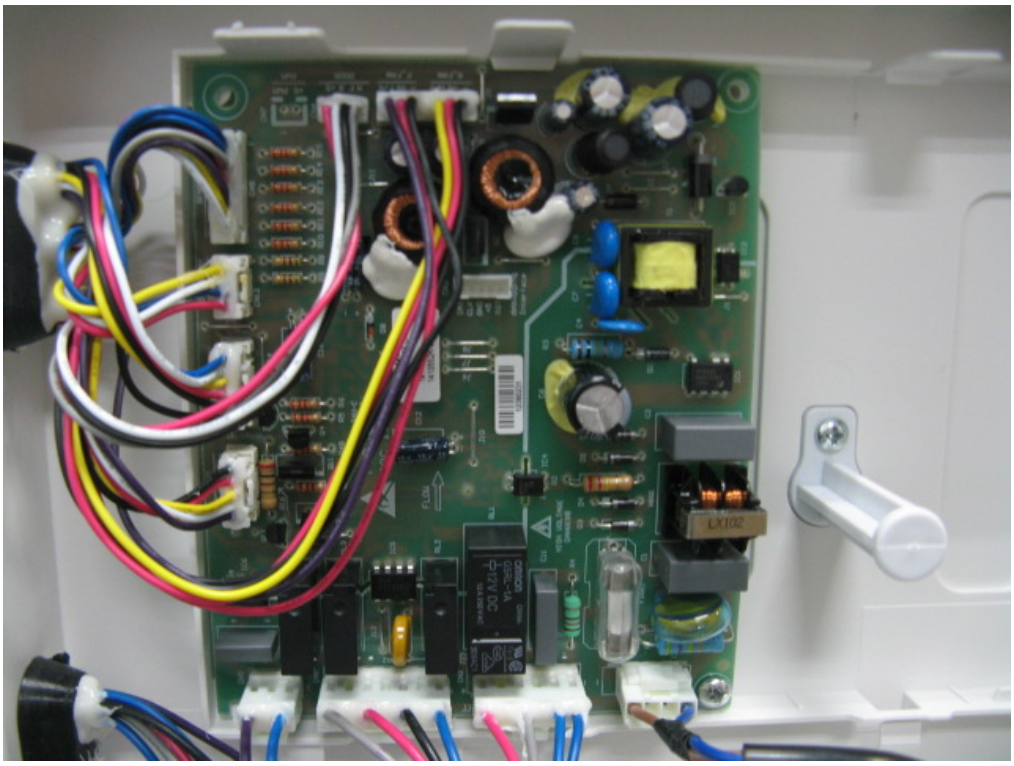


View of display board

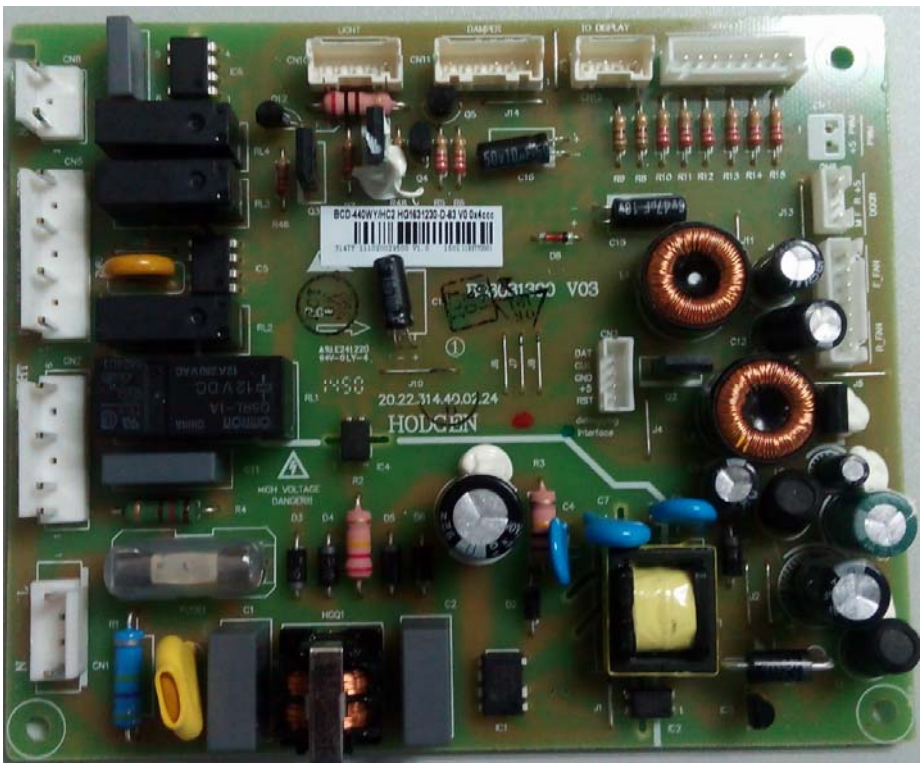
Rear view



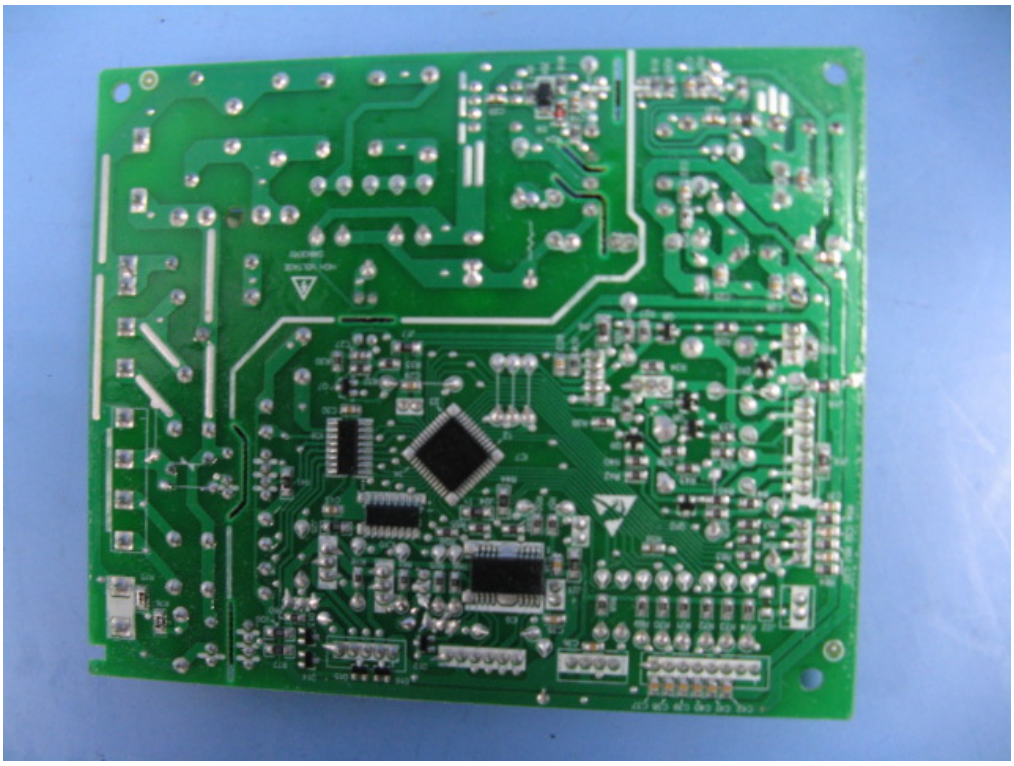
Internal view of electrical box



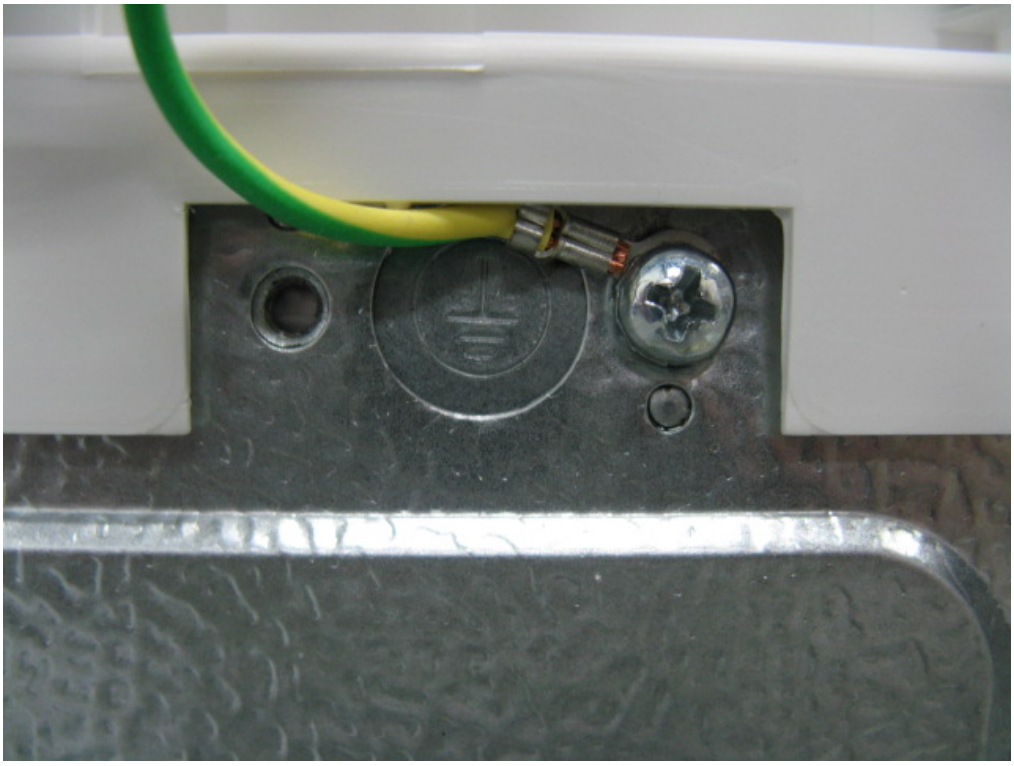
Top view of main control board



Top view of main control board

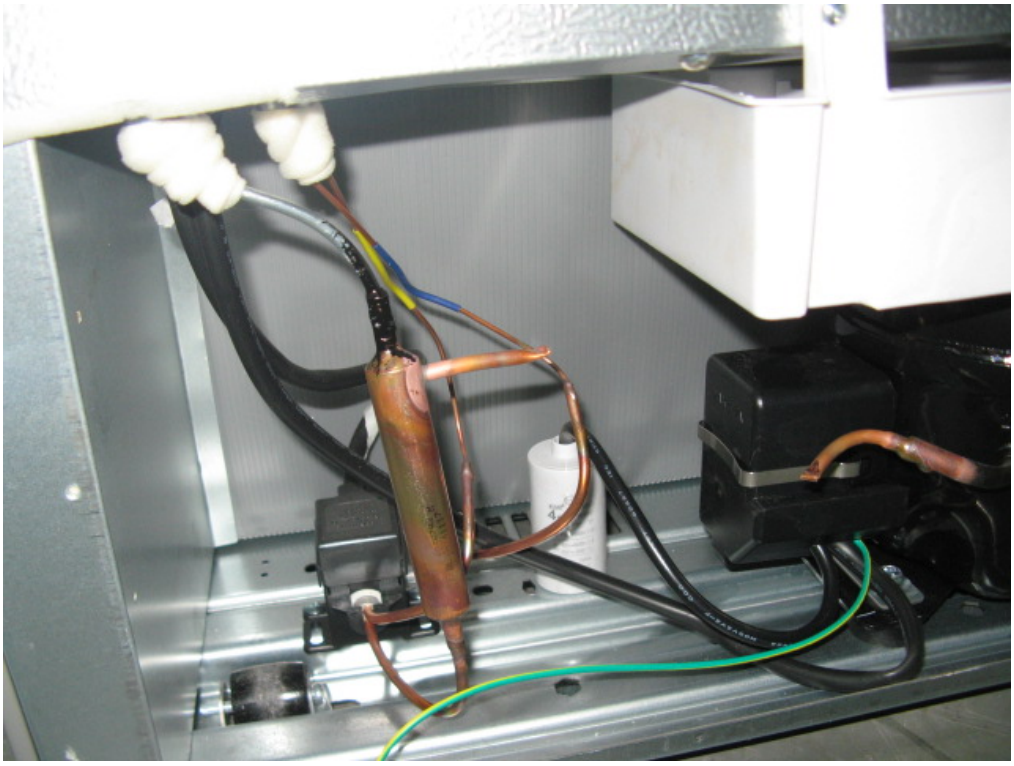


Bottom view of main control board

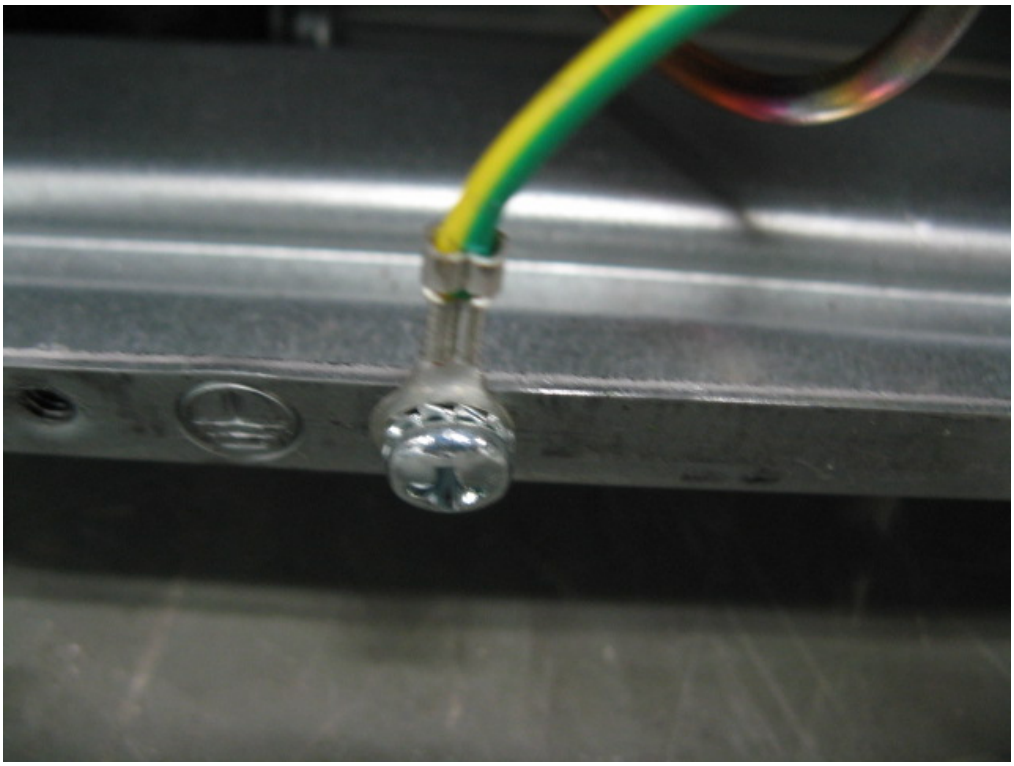


Earthing terminal

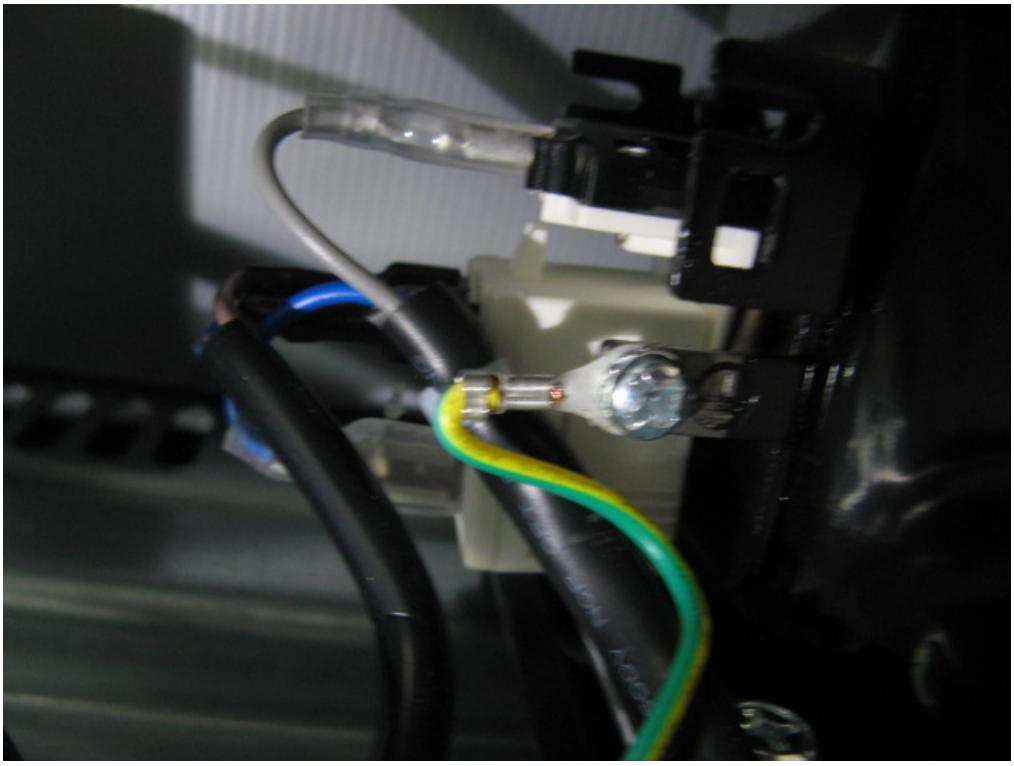
View of compressor compartment



Internal view of compressor compartment



Earthing terminal



Earthing terminal for compressor

Internal view of refrigerating compartment

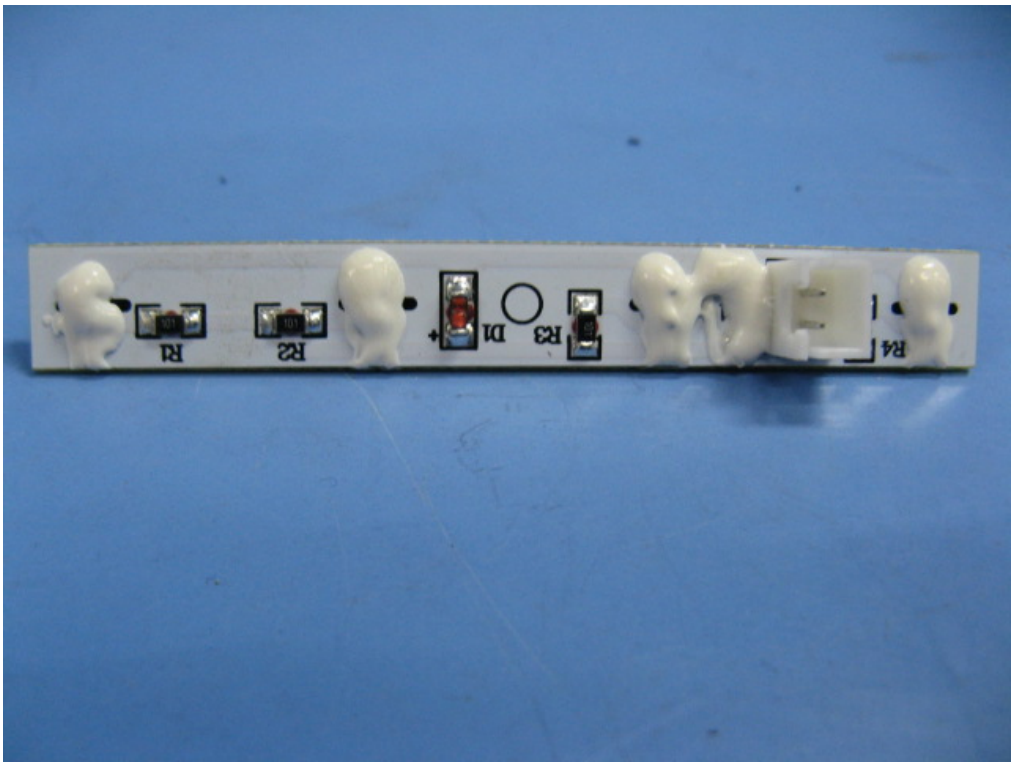
Outside view of wire connector box in refrigerating compartment

View of wire connector

View of top LED lamp box

Internal view of top LED lamp box

Top LED lamp board view

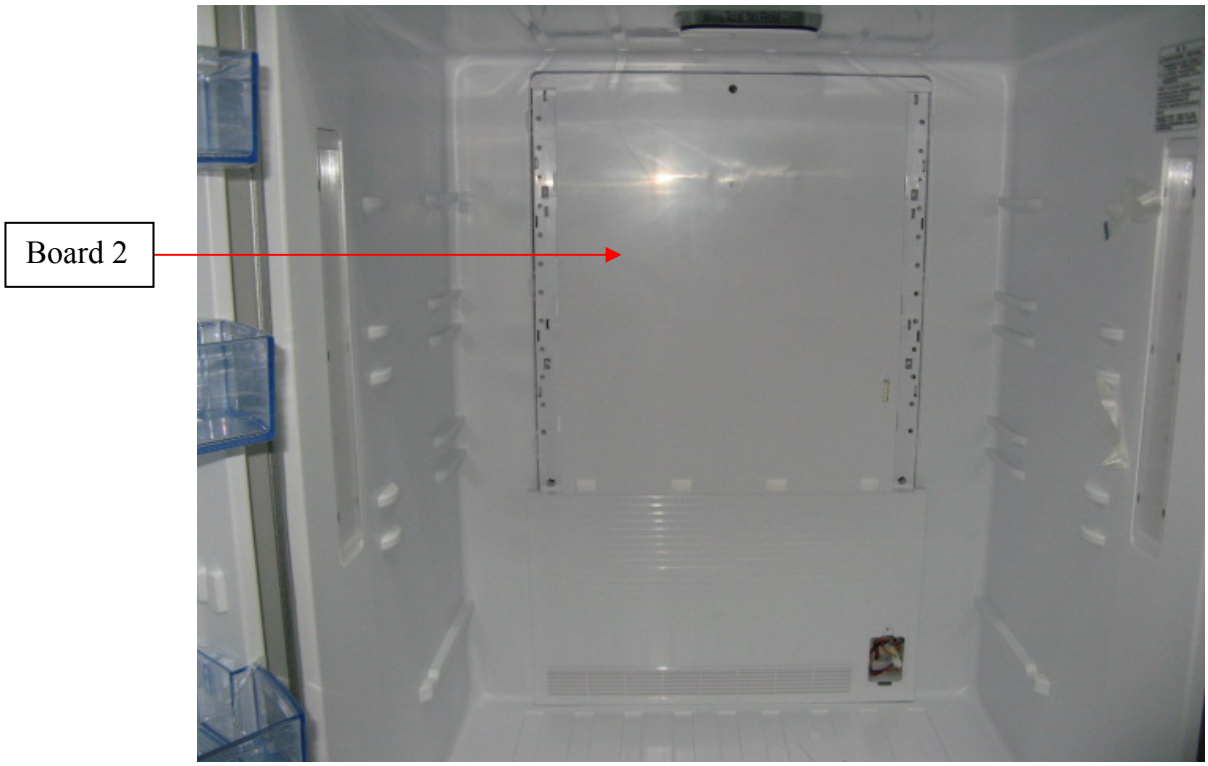


Top LED lamp board view

Side LED lamp view

Side LED lamp board view

Side LED lamp board view



Internal view of refrigerating compartment (Remove board 1)

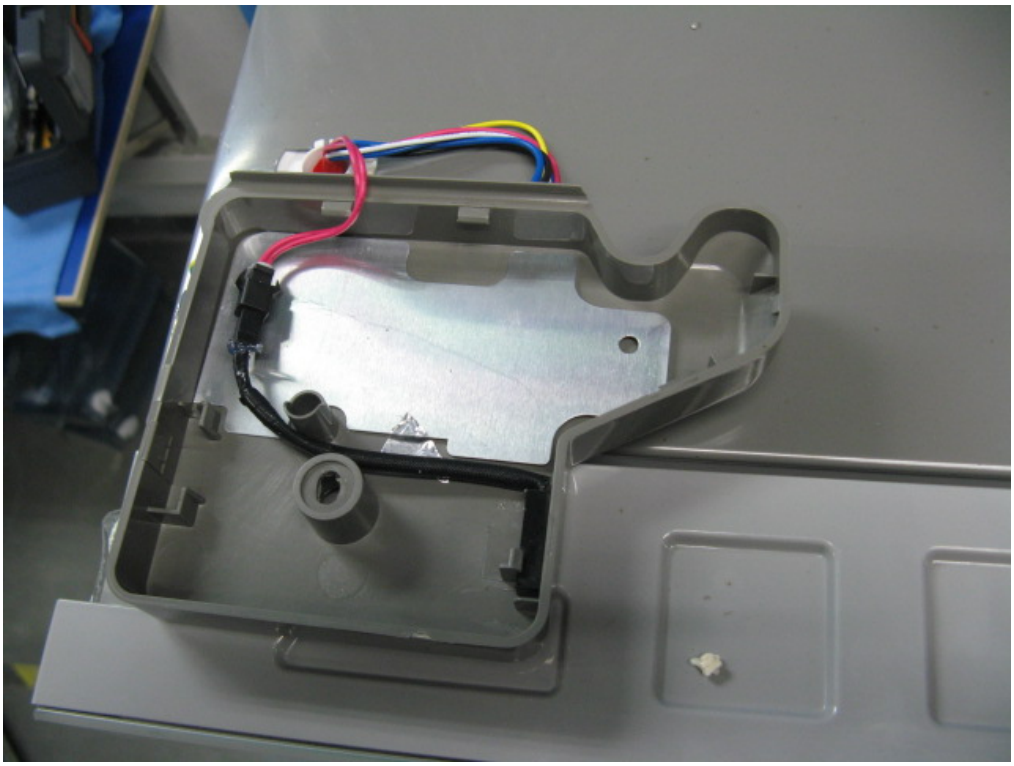
Internal view of refrigerating compartment

View of evaporator in refrigerator compartment

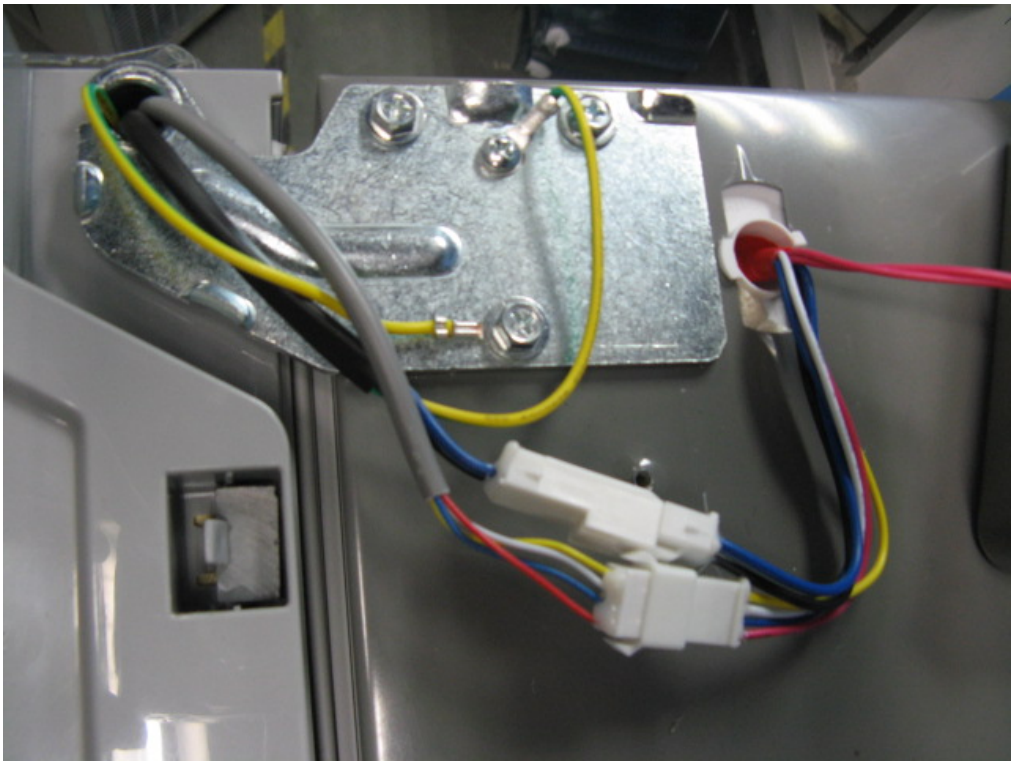
View of fan motor in refrigerating compartment

Refrigerating compartment fan motor view

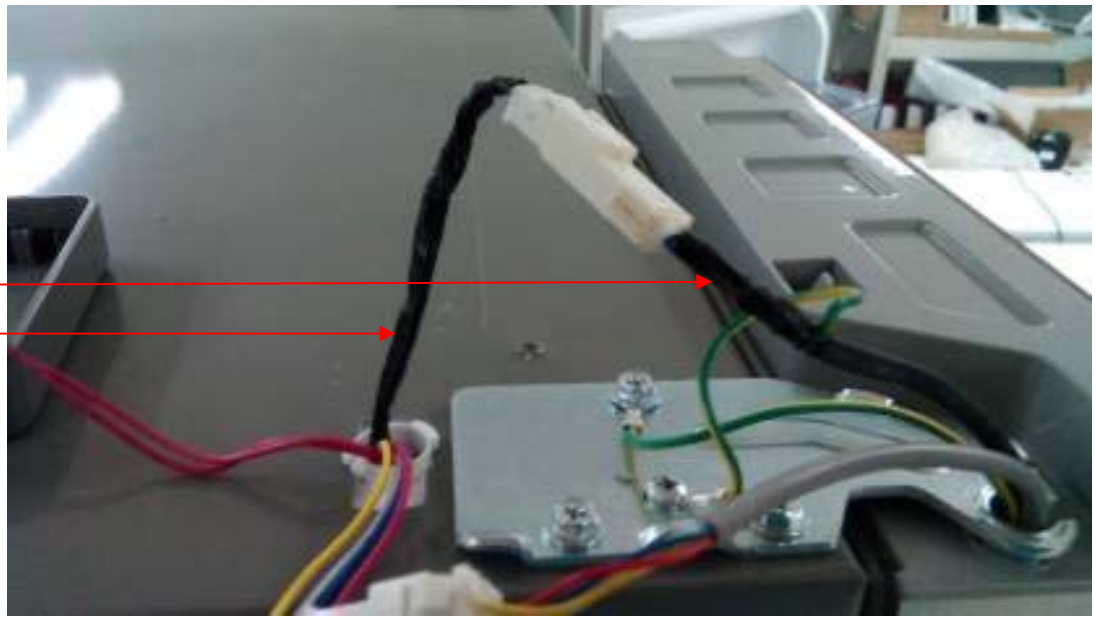
Top view of appliance



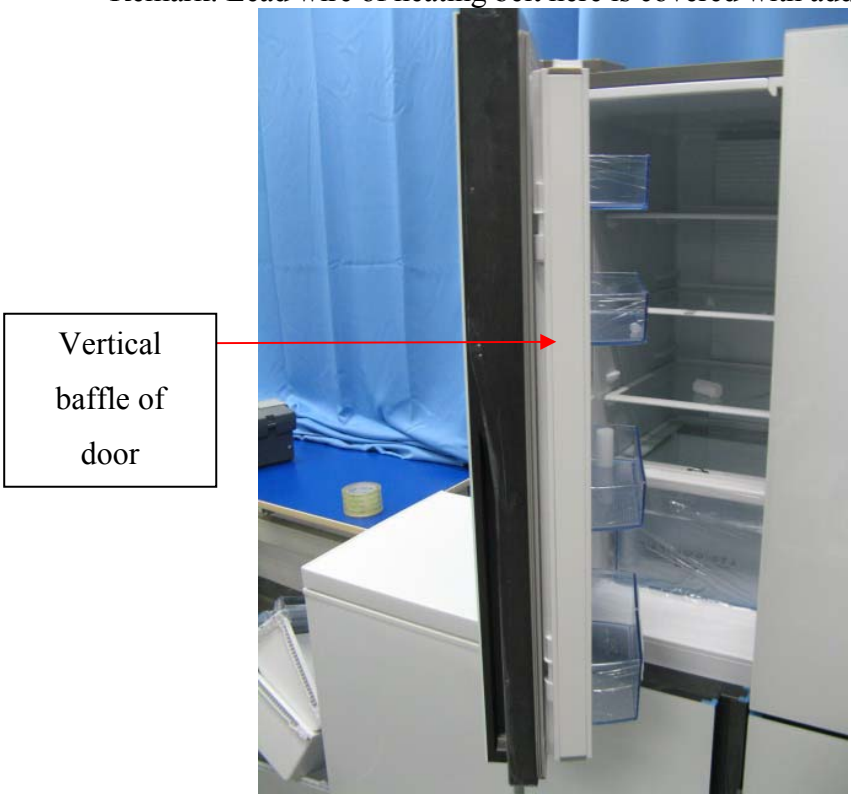
View of cover 1



Internal view of cover 1



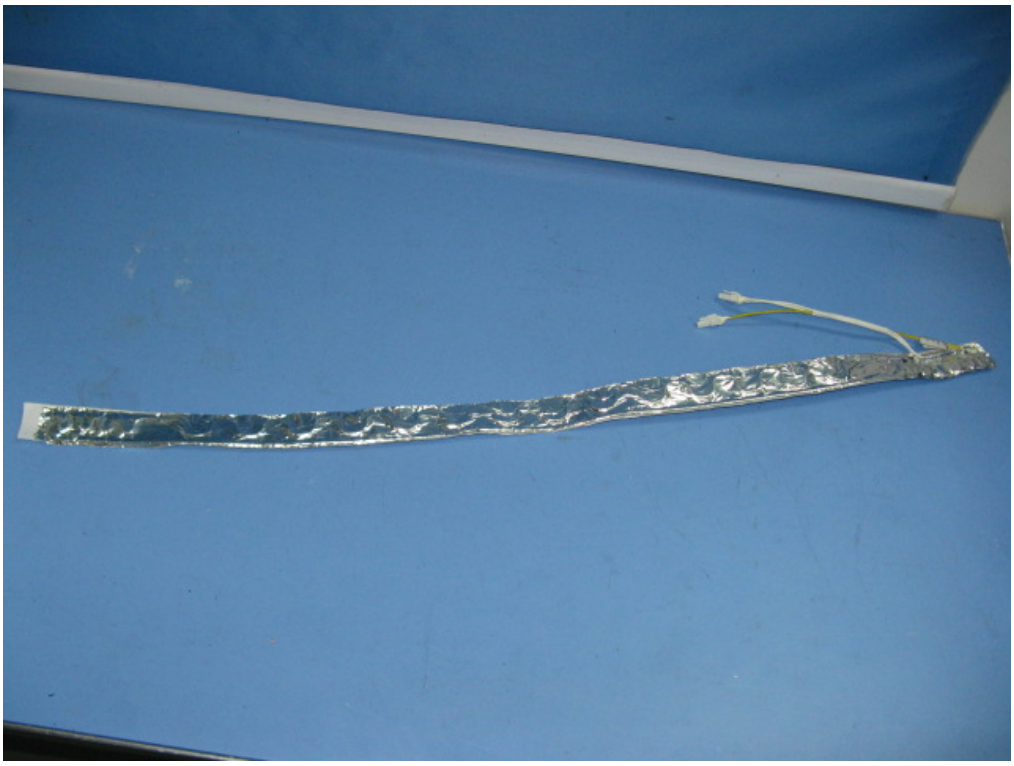
Internal view of cover 1
Remark: Lead wire of heating belt here is covered with additional tape



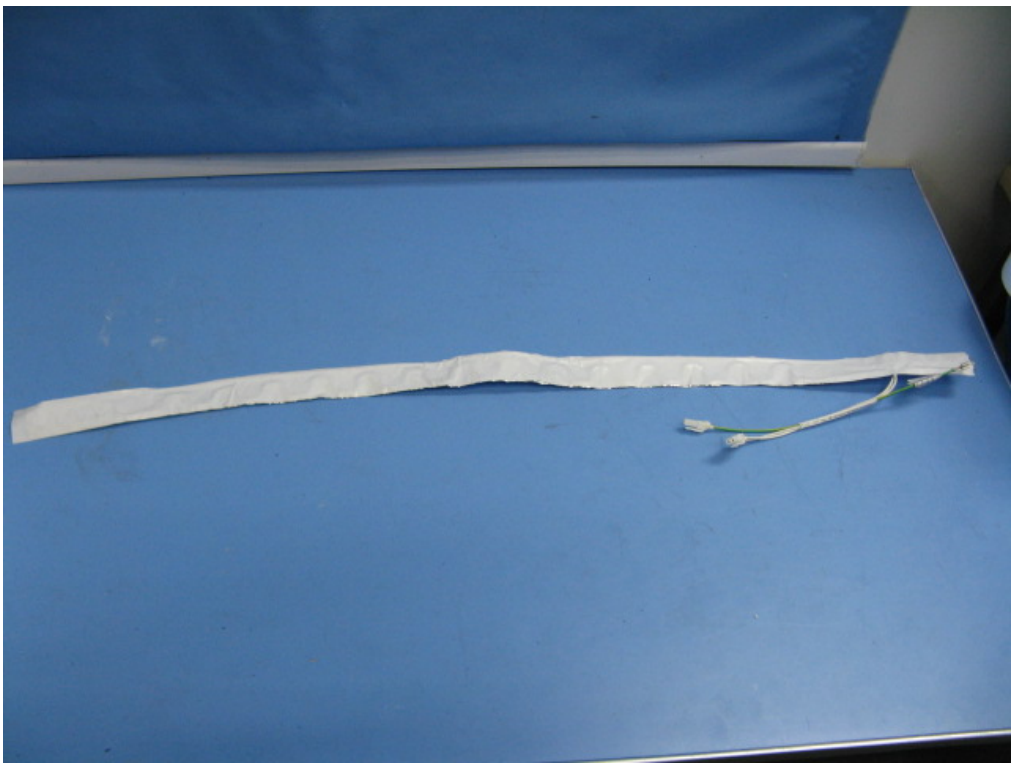
View of vertical baffle

Internal view of vertical baffle

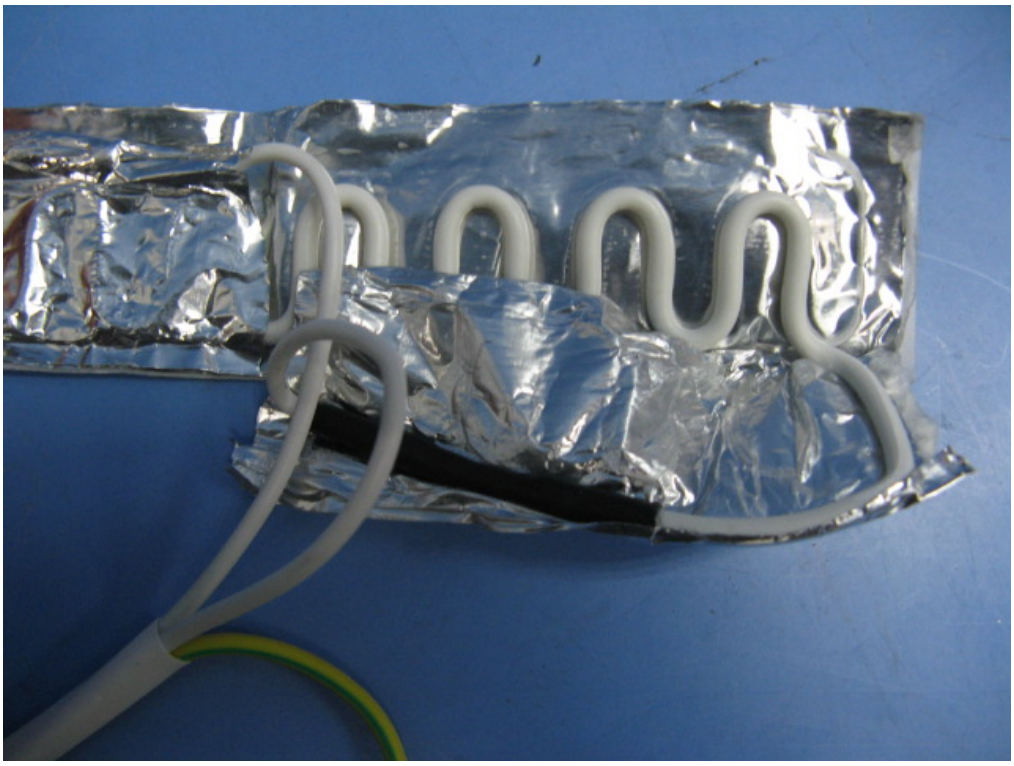
Earthing terminal of heating belt



View of heating belt



View of heating belt



Internal view of heating belt

View of freezing compartment

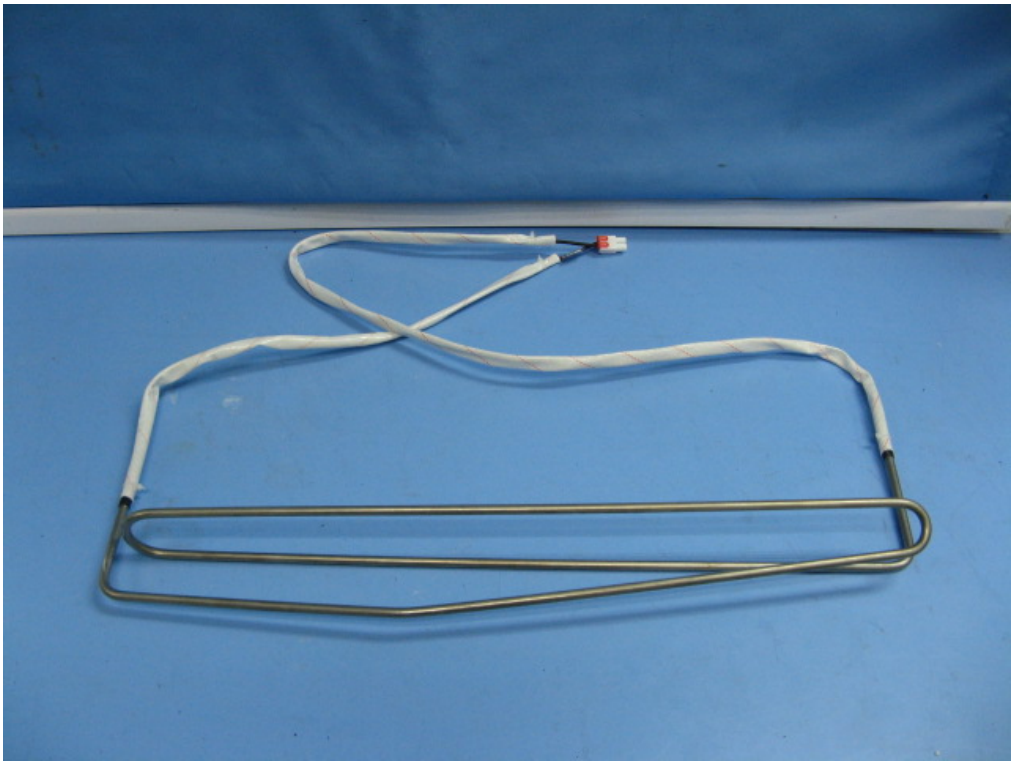
LED lamp in freezing compartment

Wire connector in freezing compartment wire connector box

Internal view of freezing compartment (After remove wind channel cover board)

Internal view of freezing compartment (After remove wind channel cover board)

Location of defrosting thermal link

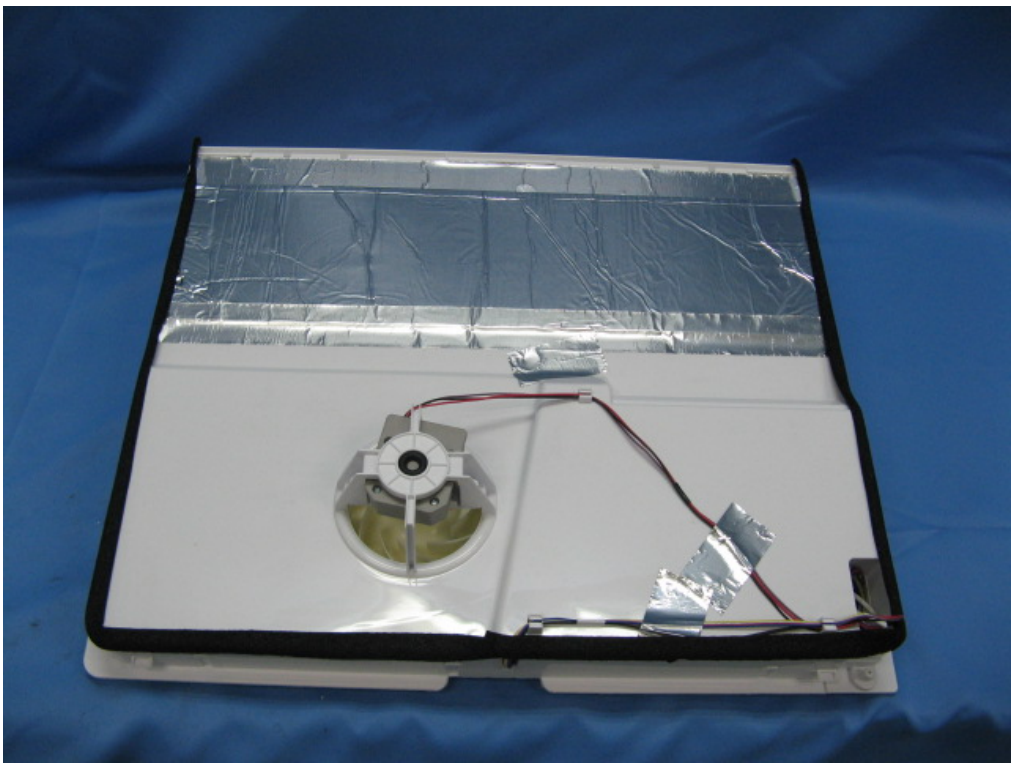


View of defrost heating element

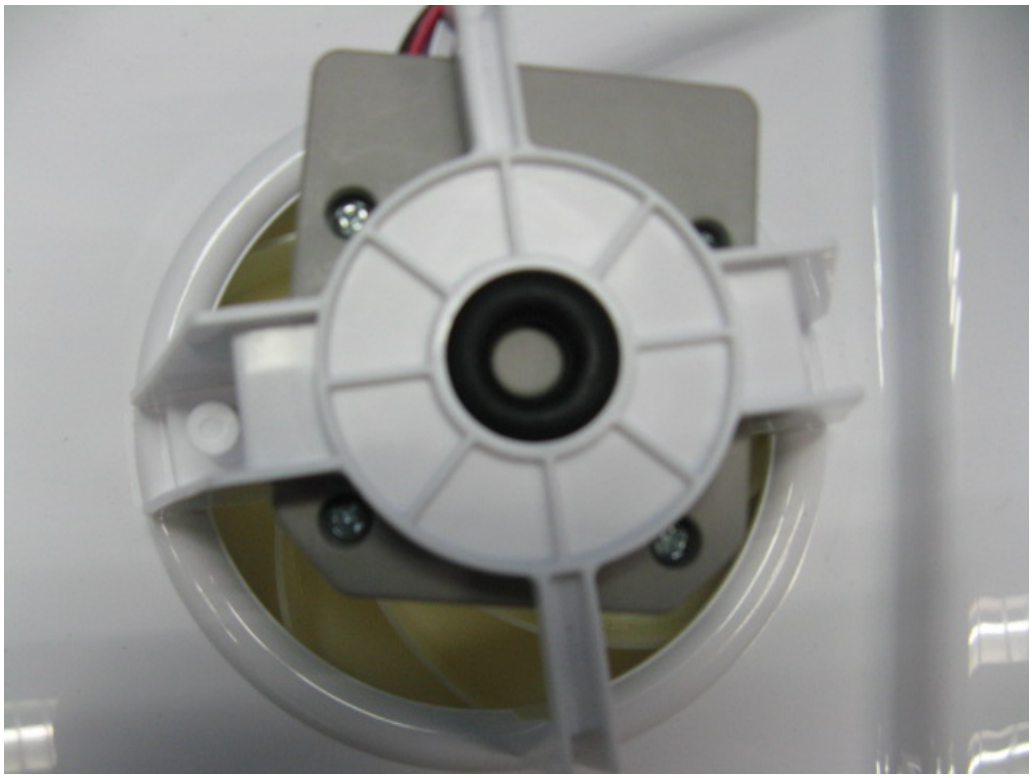
View of wind channel cover board

Internal view of wind channel cover board

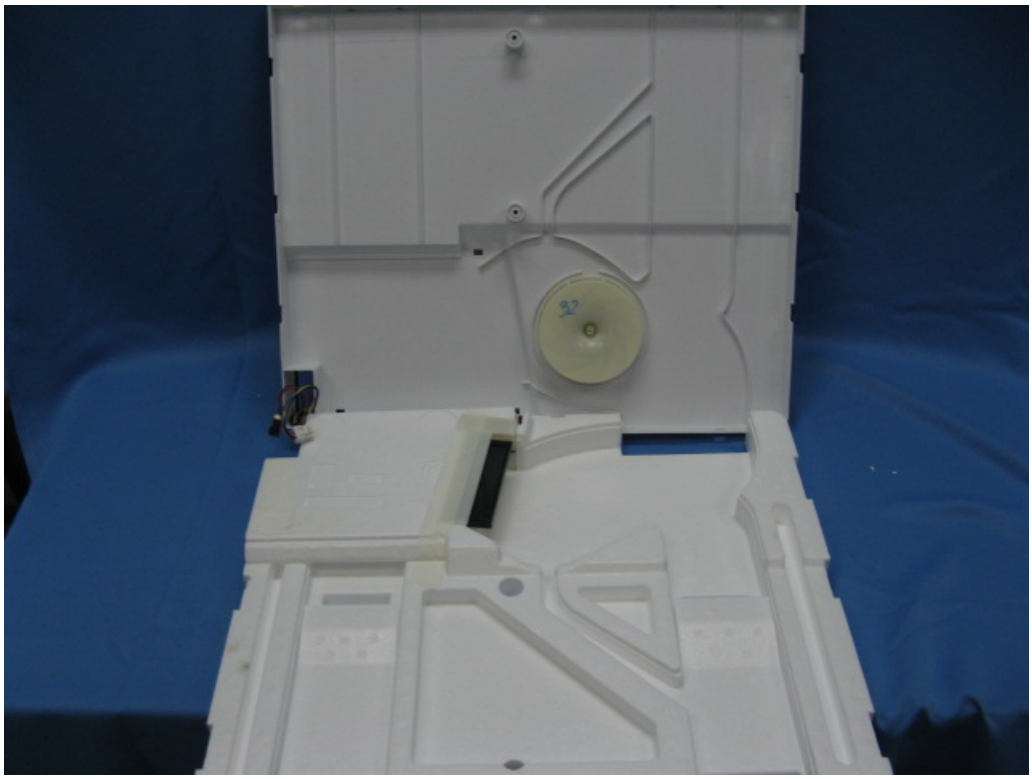
Internal view of wind channel cover board



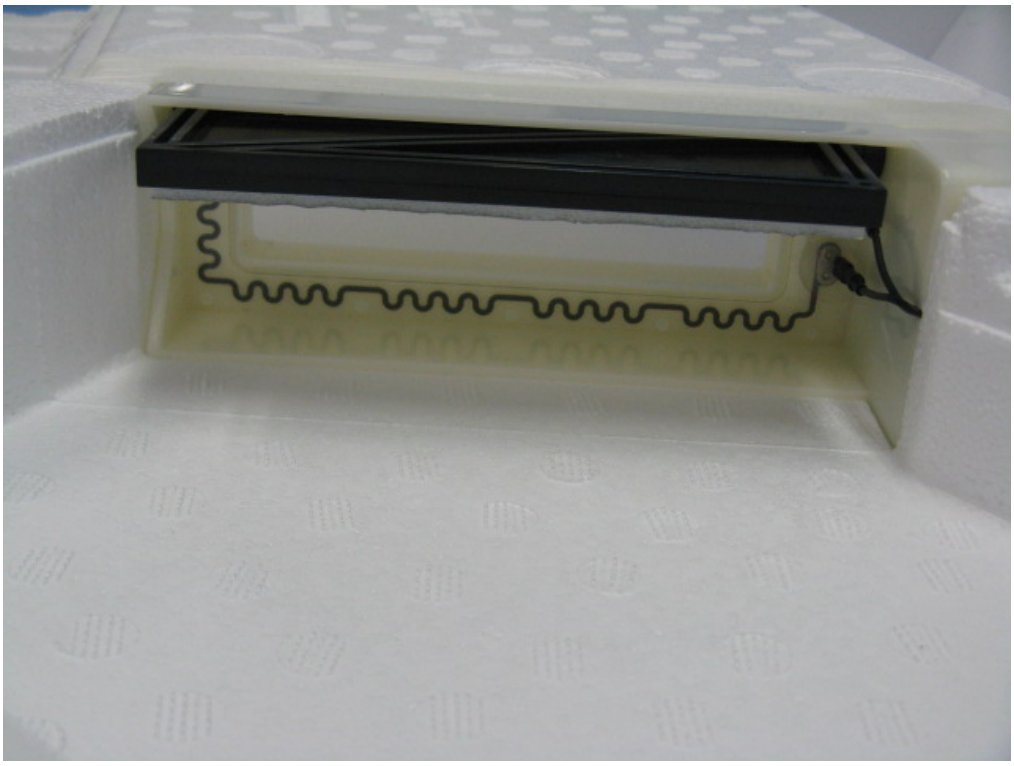
View of fan motor in freezing compartment



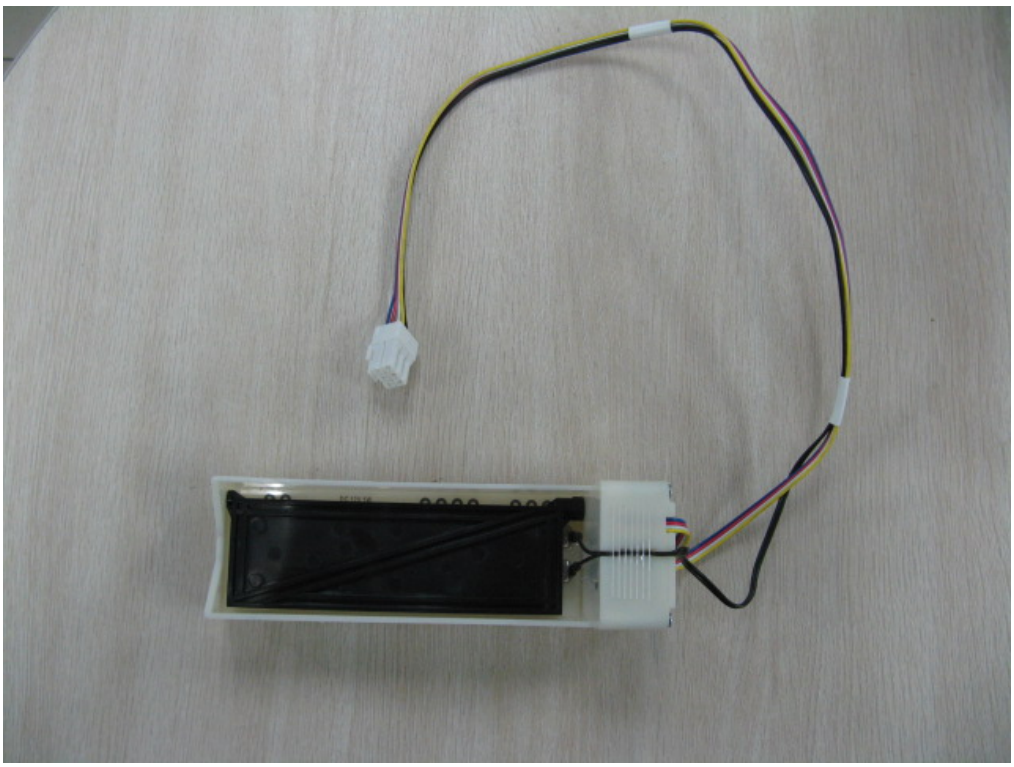
View of fan motor in freezing compartment



Internal view of wind channel cover board

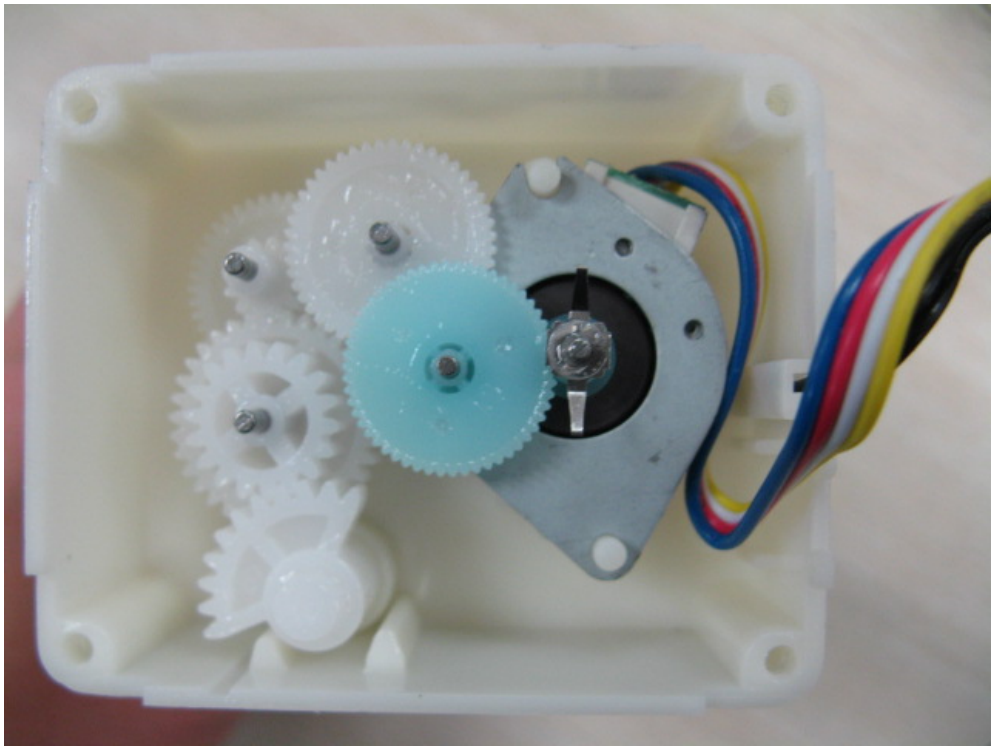


View of damper



View of damper

View of damper



Internal view of damper