

RADIO PERFORMANCE TEST REPORT

Test Report No. : OT-251-RWD-039

Reception No. : 2411004246

Applicant : LS ELECTRIC

Address : 68, Wolmyeong-ro #201, heung deok-gu, Cheongju-si, 28437, South Korea

Manufacturer : LS ELECTRIC

Address : (Cheongju 2 Factory) 68, Wolmyeong-ro 201beon-gil, Heungdeok-gu, Cheongju-si,
Chungcheongbuk-do, Republic of Korea

Type of Equipment : Molded-case circuit-breaker

FCC ID. : 2AYQX-UTS150-100-3P

Model Name : UTS150LTi ETLi 100A 3P

Multiple Model Name : N/A

Serial number : N/A

Total page of Report : 23 pages (including this page)

Date of Incoming : December 04, 2024

Date of issue : January 14, 2025

SUMMARY

The equipment complies with the regulation; **FCC PART 15 SUBPART C Section 15.247**

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

This report is not correlated with the "KS Q ISO/IEC 17025 and KOLAS accreditation" of Korean Laboratory Accreditation Scheme.



Tested by
Su-Min, Yoo / Project Engineer
ONETECH Corp.

Reviewed by
Tae-Ho, Kim / Chief Engineer
ONETECH Corp.

Approved by
Jae-Ho, Lee / Chief Engineer
ONETECH Corp.

It should not be reproduced except in full, without the written approval of ONETECH Corp.

OTC-TRF-RF-001(0)

CONTENTS

	Page
1. VERIFICATION OF COMPLIANCE	5
2. TEST SUMMARY	6
2.1 TEST ITEMS AND RESULTS	6
2.2 ADDITIONS, DEVIATIONS, EXCLUSIONS FROM STANDARDS.....	6
2.3 RELATED SUBMITTAL(S) / GRANT(S)	6
2.4 PURPOSE OF THE TEST	6
2.5 TEST METHODOLOGY.....	6
2.6 TEST FACILITY.....	6
3. GENERAL INFORMATION	7
3.1 PRODUCT DESCRIPTION.....	7
3.2 ALTERNATIVE TYPE(S)/MODEL(S); ALSO COVERED BY THIS TEST REPORT.....	7
4. EUT MODIFICATIONS.....	7
5. SYSTEM TEST CONFIGURATION	8
5.1 JUSTIFICATION.....	8
5.2 PERIPHERAL EQUIPMENT	8
5.3 MODE OF OPERATION DURING THE TEST	8
5.4 CONFIGURATION OF TEST SYSTEM.....	9
5.5 ANTENNA REQUIREMENT	9
6. MEASUREMENT UNCERTAINTY	9
7. PRELIMINARY TEST	10
7.1 AC POWER LINE CONDUCTED EMISSIONS TESTS.....	10
7.2 GENERAL RADIATED EMISSIONS TESTS	10
8. MINIMUM 6 dB BANDWIDTH.....	11
8.1 OPERATING ENVIRONMENT	11
8.2 TEST SET-UP	11
8.3 TEST DATE	11
8.4 TEST DATA.....	11
9. MAXIMUM CONDUCTED (PEAK) OUTPUT POWER.....	12
9.1 OPERATING ENVIRONMENT	12
9.2 TEST SET-UP	12
9.3 TEST DATE	12
9.4 TEST DATA.....	12

10. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND	13
10.1 OPERATING ENVIRONMENT	13
10.2 TEST SET-UP FOR CONDUCTED MEASUREMENT	13
10.3 TEST SET-UP FOR RADIATED MEASUREMENT	13
10.4 TEST DATE	13
10.5 TEST DATA FOR CONDUCTED EMISSION	13
10.6 TEST DATA FOR RADIATED EMISSION	14
10.6.1 Radiated Emission which fall in the Restricted Band	14
10.6.2 Spurious & Harmonic Radiated Emission	15
11. PEAK POWER SPECTRAL DENSITY	16
11.1 OPERATING ENVIRONMENT	16
11.2 TEST SET-UP	16
11.3 TEST DATE	16
11.4 TEST DATA	16
12. RADIATED EMISSION TEST	17
12.1 OPERATING ENVIRONMENT	17
12.2 TEST SET-UP	17
12.3 TEST DATE	17
12.4 TEST DATA	18
12.4.1 Test data for 30 MHz ~ 1 000 MHz	18
12.4.2 Test data for Below 30 MHz	19
12.4.3 Test data for above 1 GHz	19
13. CONDUCTED EMISSION TEST	20
13.1 OPERATING ENVIRONMENT	20
13.2 TEST SET-UP	20
13.3 TEST DATE	20
13.4 TEST DATA	21
14. LIST OF TEST EQUIPMENT	23

※ Please refer to the Annex section for All test plots

Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-251-RWD-039	January 14, 2025	Initial Release	All

1. VERIFICATION OF COMPLIANCE

Applicant : LS ELECTRIC
Address : 68, Wolmyeong-ro #201, heung deok-gu, Cheongju-si, 28437, South Korea
Contact Person : MINKYU SEO / MANAGER
Telephone No. : +82-10-9417-8103
FCC ID : 2AYQX-UTS150-100-3P
Model Name : UTS150LTi ETLi 100A 3P
Brand Name : -
Serial Number : N/A
Date : January 14, 2025

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	Molded-case circuit-breaker
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2013
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.247 KDB 558074 D01 15.247 Meas Guidance v05r02
Modifications on the Equipment to Achieve Compliance	None
Final Test was Conducted On	3 m, Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.247 (a) (2)	Minimum 6 dB Bandwidth	Met the Limit / PASS
15.247 (b) (3)	Maximum Peak Conducted Output Power	Met the Limit / PASS
15.247 (d)	100 kHz Bandwidth Outside the Frequency Band	Met the Limit / PASS
15.247 (d)	Radiated Emission which fall in the Restricted Band	Met the Limit / PASS
15.247 (e)	Peak Power Spectral Density	Met the Limit / PASS
15.209	Radiated Emission Limits	Met the Limit / PASS
15.207	Conducted Limits	Met the Limit / PASS
15.203	Antenna Requirement	Met requirement / PASS

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in FCC PART 15 SUBPART C Section 15.247.

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The Onetech Corp. has been designated to perform equipment testing in compliance with ISO/IEC 17025.

The Electromagnetic compatibility measurement facilities are located at 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea.

-. Site Filing:

VCCI (Voluntary Control Council for Interference) – Registration No. R-20122/ C-14617/ G-10666/ T-11842

ISED (Innovation, Science and Economic Development Canada) – Registration No. Site# 3736A-3

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation NO. KT085

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

3. GENERAL INFORMATION

3.1 Product Description

The LS ELECTRIC, Model UTS150LTi ETLi 100A 3P (referred to as the EUT in this report) is a Molded-case circuit-breaker. The product specification described herein was obtained from product data sheet or user's manual.

Device Type	Molded-case circuit-breaker		
Temperature Range	-5 °C ~ +40 °C		
Operating Frequency	2 402 MHz ~ 2 480 MHz		
MAX. RF OUTPUT POWER	Bluetooth LE	1 Mbps	-5.19 dBm
Number of Channel	Bluetooth LE	40 Channels	
Modulation Type	Bluetooth LE	GFSK	
Antenna Type	Chip Antenna		
Antenna Gain	1.90 dBi		
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	48 MHz		
Rated Supply Voltage	DC 24.0 V		

3.2 Alternative type(s)/model(s); also covered by this test report.

-. None

4. EUT MODIFICATIONS

-. None

5. SYSTEM TEST CONFIGURATION

5.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	N/A	SMCCB_MAIN	N/A
BLE Board	N/A	TSi250_BLE	N/A
SUB 1 Board	N/A	TSi250_EXIO	N/A
SUB 2 Board	N/A	TSi250_V SEN	N/A
SUB 3 Board	N/A	GJD-T12348AFP-FP	N/A

5.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	Description	Connected to
UTS150LTi ETLi 100A 3P	LS ELECTRIC	Molded-case circuit-breaker (EUT)	-
IdeaPad L340	LENOVO	Notebook PC	EUT

5.3 Mode of operation during the test

For the testing, software used to control the EUT for staying in continuous transmitting is programmed.

For final testing, the EUT was set at 2 402 MHz, 2 440 MHz, and 2 480 MHz to get a maximum emission levels from the EUT. The EUT was moved throughout the XY, XZ, and YZ planes and the worst case is “XY” axis, but the worst data was recorded in this report.

-. Frequency / Channel Operations

Channel	Frequency
0	2 402
19	2 440
39	2 480

-. Duty Cycle

Mode	Tx On Time [ms]	Tx Off Time [ms]	Duty Cycle [%]	Correction Factor [dB]
Bluetooth LE 1 Mbps	-	-	100	-

Note – Duty Cycle : (Tx On Time / (Tx On Time + Tx Off Time)) * 100

Correction Factor : 10 * Log(1 / (Duty Cycle / 100))

5.4 Configuration of Test System

Line Conducted Test: The EUT was tested in the Transmitting mode. All supporting equipment were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meter Semi Anechoic Chamber.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

5.5 Antenna Requirement

For intentional device, according to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The antenna of the EUT is a Chip Antenna on the main board in the EUT, so no consideration of replacement by the user.

6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence.

The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Output Power	1.20
Conducted Spurious Emission < 26.5 GHz	1.26
Power Spectral Density	1.20
Line Conducted Disturbance (150 kHz ~ 30 MHz)	2.00
Radiated Disturbance (9 kHz ~ 30 MHz)	3.30
Radiated Disturbance (30 MHz ~ 1 GHz)	4.42
Radiated Disturbance (1 GHz ~ 18 GHz)	5.10
Radiated Disturbance (18 GHz ~ 40 GHz)	5.65

7. PRELIMINARY TEST

7.1 AC Power line Conducted Emissions Tests

During Preliminary Test, the following operating mode was investigated.

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

7.2 General Radiated Emissions Tests

During Preliminary Test, the following operating mode was investigated.

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

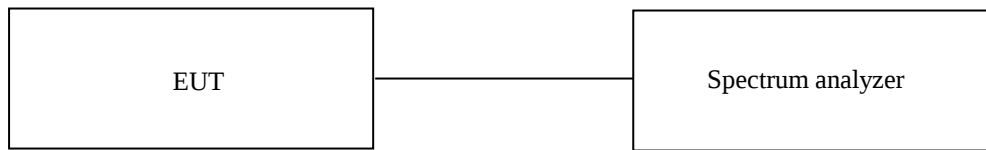
8. MINIMUM 6 dB BANDWIDTH

8.1 Operating environment

Temperature : 22 °C
Relative humidity : 45 % R.H.

8.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, and peak detection was used. The 6 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 6 dB.



8.3 Test Date

December 04, 2024 ~ December 13, 2024

8.4 Test data

CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2 402.00	689.15	500.00	189.15
Middle	2 440.00	719.36	500.00	219.36
High	2 480.00	714.24	500.00	214.24

Remark. Margin = Measured Value - Limit

9. MAXIMUM CONDUCTED (PEAK) OUTPUT POWER

9.1 Operating environment

Temperature : 22 °C
Relative humidity : 45 % R.H.

9.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer.

The resolution bandwidth is set to $\geq$ DTS Bandwidth, the video bandwidth is set to 3 times the resolution bandwidth.



9.3 Test Date

December 04, 2024 ~ December 13, 2024

9.4 Test data

-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 402.00	-5.19	30.00	35.19
MIDDLE	2 440.00	-5.29	30.00	35.29
HIGH	2 480.00	-6.28	30.00	36.28

Remark. Margin = Limit – Measured Value

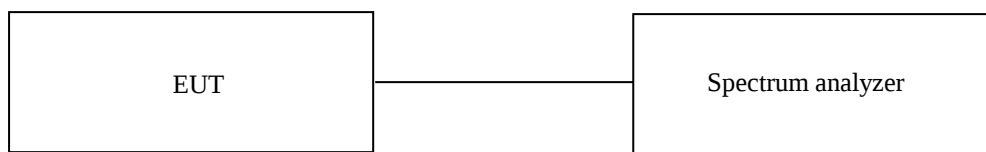
10. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

10.1 Operating environment

Temperature : 22 °C
Relative humidity : 45 % R.H.

10.2 Test set-up for conducted measurement

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, the video bandwidth is set to 3 times the resolution bandwidth and peak detection was used.



10.3 Test set-up for radiated measurement

The radiated emissions measurements were performed on the 3 m semi anechoic chamber. The EUT was placed on turntable approximately 1.5 m above the ground plane.

The frequency spectrum from 30 MHz to 26.5 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

10.4 Test Date

December 04, 2024 ~ December 13, 2024

10.5 Test data for conducted emission

For Test data for conducted emission, please refer to the Annex.

10.6 Test data for radiated emission

10.6.1 Radiated Emission which fall in the Restricted Band

- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Measurement distance : 3 m
- . Duty Cycle : 100 %
- . Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain	ATT (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel											
2 379.07	47.69	Peak	H	27.58	4.63	41.74	6.12	-	44.28	74.00	29.72
2 357.75	37.48	Average	H	27.67	4.61	41.74	6.11	-	34.13	54.00	19.87
2 369.69	48.38	Peak	V	27.62	4.62	41.74	6.11	-	44.99	74.00	29.01
2 373.92	38.88	Average	V	27.60	4.63	41.74	6.11	-	35.48	54.00	18.52
Test Data for High Channel											
2 489.64	48.52	Peak	H	27.40	4.90	41.73	6.11	-	45.20	74.00	28.80
2 490.98	37.60	Average	H	27.40	4.91	41.73	6.11	-	34.29	54.00	19.71
2 486.90	49.15	Peak	V	27.40	4.89	41.73	6.11	-	45.82	74.00	28.18
2 486.72	38.43	Average	V	27.40	4.89	41.73	6.11	-	35.10	54.00	18.90

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{AMP Gain} + \text{ATT} + \text{Duty Factor}$$

10.6.2 Spurious & Harmonic Radiated Emission

- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
1 MHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Frequency range : 1 GHz ~ 26.5 GHz
- . Measurement distance : 3 m
- . Duty Cycle : 100 %
- . Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
4 804.45	57.01	Peak	H	31.20	6.60	41.29	-	53.52	74.00	20.48
4 804.24	52.85	Average	H	31.20	6.60	41.29	-	49.36	54.00	4.64
4 804.58	56.88	Peak	V	31.20	6.60	41.29	-	53.39	74.00	20.61
4 803.86	52.95	Average	V	31.20	6.60	41.29	-	49.46	54.00	4.54
Test Data for Middle Channel										
4 879.47	56.88	Peak	H	31.26	6.68	41.27	-	53.55	74.00	20.45
4 879.88	52.41	Average	H	31.26	6.68	41.27	-	49.08	54.00	4.92
4 879.70	56.68	Peak	V	31.26	6.68	41.27	-	53.35	74.00	20.65
4 879.93	52.75	Average	V	31.26	6.68	41.27	-	49.42	54.00	4.58
Test Data for High Channel										
4 960.42	56.01	Peak	H	31.54	6.74	41.25	-	53.04	74.00	20.96
4 960.13	51.67	Average	H	31.54	6.74	41.25	-	48.70	54.00	5.30
4 959.58	56.29	Peak	V	31.54	6.74	41.25	-	53.32	74.00	20.68
4 960.10	52.14	Average	V	31.54	6.74	41.25	-	49.17	54.00	4.83

Remark: "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{AMP Gain} + \text{Duty Factor}$$

11. PEAK POWER SPECTRAL DENSITY

11.1 Operating environment

Temperature : 22 °C
Relative humidity : 45 % R.H.

11.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer.

The resolution bandwidth is set to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$, the video bandwidth is set to 3 times the resolution bandwidth.



11.3 Test Date

December 04, 2024 ~ December 13, 2024

11.4 Test data

-. Test Result : Pass

CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 402.00	-16.55	8.00	24.55
Middle	2 440.00	-16.84	8.00	24.84
High	2 480.00	-18.07	8.00	26.07

Remark. Margin = Limit – Measured Value

12. RADIATED EMISSION TEST

12.1 Operating environment

Temperature : 22 °C
Relative humidity : 45 % R.H.

12.2 Test set-up

The radiated emissions measurements were on the 3 m semi anechoic chamber. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30 MHz to 26.5 GHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

12.3 Test Date

December 04, 2024 ~ December 13, 2024

12.4 Test data

12.4.1 Test data for 30 MHz ~ 1 000 MHz

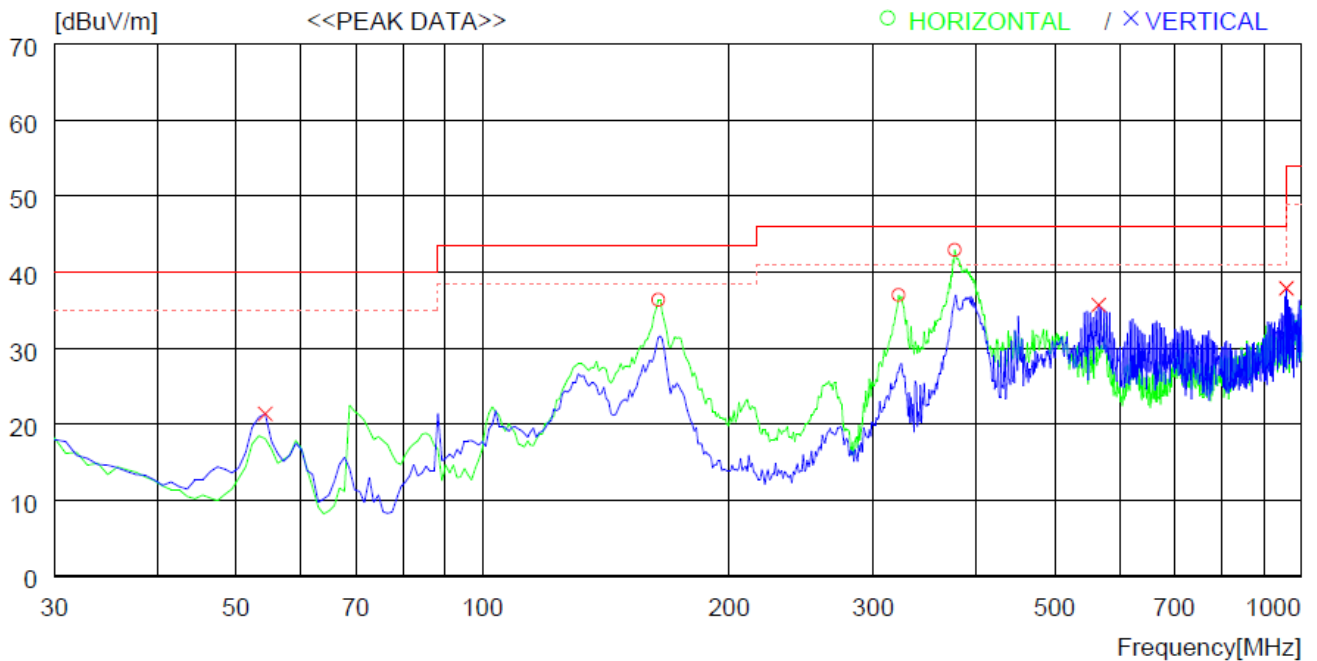
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Molded-case circuit-breaker

Test mode : Worst case (Low CH)

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



No.	FREQ [MHz]	READING [dBuV]	ANT PEAK FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	163.860	50.2	17.6	1.6	33.0	36.4	43.5	7.1	200	251
2	321.970	48.3	19.4	2.3	33.0	37.0	46.0	9	100	359
3	377.260	53.1	20.3	2.5	33.0	42.9	46.0	3.1	100	29
----- Vertical -----										
4	54.250	41.1	12.4	0.9	33.0	21.4	40.0	18.6	100	0
5	565.439	42.1	23.9	3.0	33.3	35.7	46.0	10.3	100	0
6	958.277	37.4	28.2	4.1	31.8	37.9	46.0	8.1	100	0

12.4.2 Test data for Below 30 MHz

- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m
- . Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
Emission from the EUT more than 20 dB below the limit in each frequency range.									

12.4.3 Test data for above 1 GHz

- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Frequency range : 1 GHz ~ 26.5 GHz
- . Measurement distance : 3 m
- . Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
Emission from the EUT more than 20 dB below the limit in each frequency range.									

13. CONDUCTED EMISSION TEST

13.1 Operating environment

Temperature : 22 °C
Relative humidity : 45 % R.H.

13.2 Test set-up

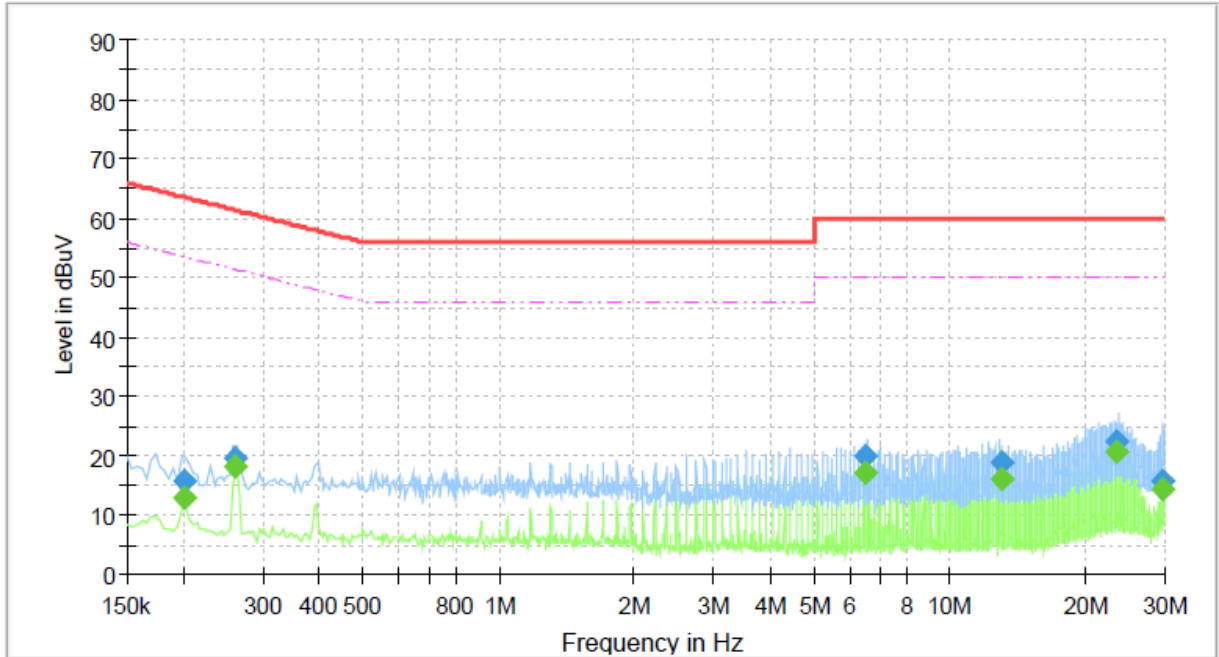
The EUT was placed on a wooden table, 0.8 m height above the floor. Power was fed to the EUT through a 50 Ω / 50 μ H + 5 Ω Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

13.3 Test Date

December 04, 2024 ~ December 13, 2024

13.4 Test data

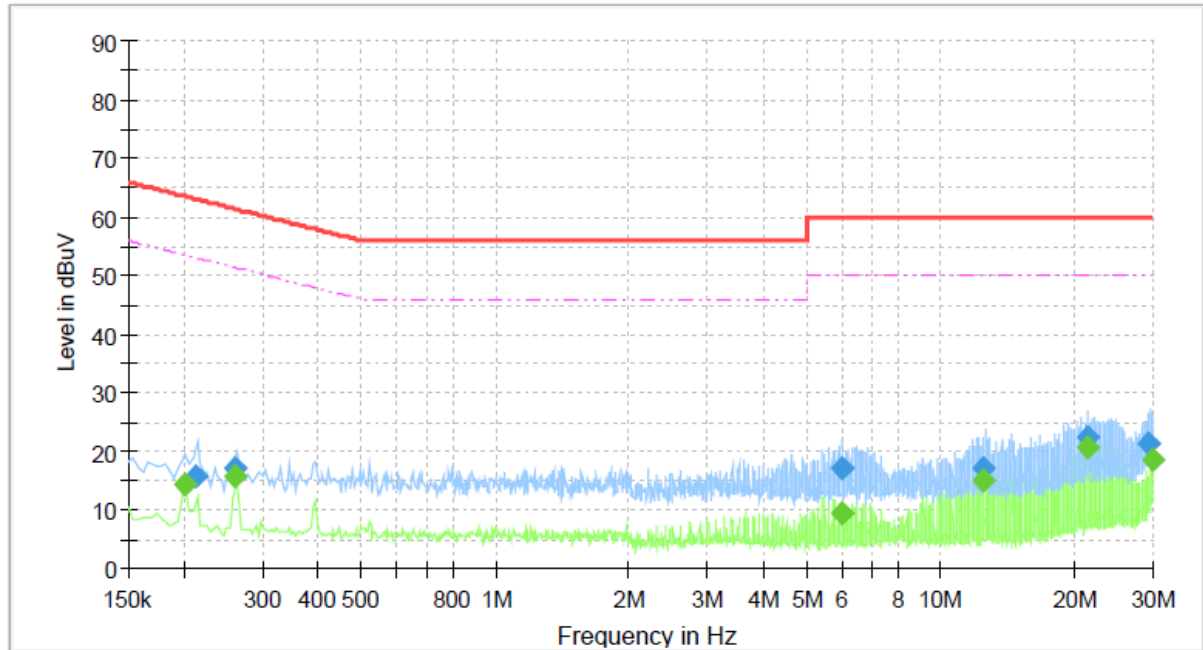
- . Resolution bandwidth : 9 kHz
- . Frequency range : 0.15 MHz ~ 30 MHz
- . Test mode : Worst case (Low CH)
- . Tested Line : HOT LINE



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.202	---	12.91	53.55	40.64	9.0	L1	10.15
0.202	15.81	---	63.55	47.74	9.0	L1	10.15
0.262	---	18.34	51.38	33.04	9.0	L1	10.15
0.262	19.68	---	61.38	41.70	9.0	L1	10.15
6.533	19.92	---	60.00	40.08	9.0	L1	10.36
6.533	---	17.33	50.00	32.67	9.0	L1	10.36
13.065	---	16.23	50.00	33.77	9.0	L1	10.66
13.067	18.78	---	60.00	41.22	9.0	L1	10.66
23.387	---	20.65	50.00	29.35	9.0	L1	11.08
23.521	22.32	---	60.00	37.68	9.0	L1	11.08
29.524	---	14.45	50.00	35.55	9.0	L1	11.23
29.752	15.79	---	60.00	44.21	9.0	L1	11.24

-. Tested Line : NEUTRAL LINE



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.202	---	14.31	53.55	39.23	9.0	N	10.15
0.213	15.66	---	63.07	47.41	9.0	N	10.15
0.262	---	15.74	51.38	35.65	9.0	N	10.15
0.262	17.30	---	61.38	44.09	9.0	N	10.15
6.006	17.19	---	60.00	42.81	9.0	N	10.36
6.006	---	9.42	50.00	40.58	9.0	N	10.36
12.426	---	15.00	50.00	35.00	9.0	N	10.66
12.428	17.11	---	60.00	42.89	9.0	N	10.66
21.316	22.44	---	60.00	37.56	9.0	N	11.09
21.453	---	20.73	50.00	29.27	9.0	N	11.10
29.467	21.35	---	60.00	38.65	9.0	N	11.39
29.957	---	18.70	50.00	31.30	9.0	N	11.41

Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

14. LIST OF TEST EQUIPMENT

Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
FSV40-N	Rohde & Schwarz	Signal Analyzer	102196	Jan. 15, 2024 (1Y)
FSV40-N	Rohde & Schwarz	Signal Analyzer	101651	Jan. 15, 2024 (1Y)
GP-4303D	LG Precision Co.,Ltd	DC POWER SUPPLY	5071069	Jan. 04, 2024 (1Y)
ZUP36-6	TDK-Lambda	DC POWER SUPPLY	205214-2021	Jan. 16, 2024 (1Y)
ESW44	Rohde & Schwarz	EMI Test Receiver	101851	Mar. 06, 2024 (1Y)
310N	Sonoma Instrument	Pre-Amplifier	392756	Oct. 16, 2024 (1Y)
SCU18	Rohde & Schwarz	Pre-Amplifier	102266	Jul. 04, 2024 (1Y)
SCU40A	Rohde & Schwarz	Pre-Amplifier	100436	Jan. 23, 2024 (1Y)
DT5000	Innco Systems GmbH	Turn Table	N/A	N/A
MA-4000XPET	Innco Systems GmbH	Antenna Master	MA4000/509/37211215/L	N/A
CO3000	Innco Systems GmbH	Controller	N/A	N/A
FMZB 1513	Schwarzbeck	Loop Antenna	1513-235	Mar. 20, 2024 (2Y)
HLP-2008	TDK RF Solutions	Hybrid Antenna	131313	Apr. 05, 2023 (2Y)
BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1349	Jul. 02, 2024 (1Y)
BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Jan. 04, 2024 (1Y)
HPF 3GHz	Rohde & Schwarz	High Pass Filter	N/A	Jan. 15, 2024 (1Y)
8493C	HP	6 dB Attenuator	01925	Jul. 04, 2024 (1Y)
ESR 3	Rohde & Schwarz	EMI TEST RECEIVER	102602	Mar. 11, 2024 (1Y)
NSLK8126	Schwarzbeck	LISN	8126480	Sep. 26, 2024 (1Y)
3825/2	EMCO	AMN	9109-1869	Mar. 15, 2024 (1Y)
VTSD 9561-F	Schwarzbeck	PULSE LIMITER	01337	Sep. 26, 2024 (1Y)