

# CERTIFICATE

## of Conformity Directive 2014/30/EU Electromagnetic Compatibility

**Registration No.:** AE 50689159 0001  
**Report No.:** KR25EYYB 001  
**Holder:** HANSOL ELECTRONICS CO.,LTD  
180-28, Yeongok-gil,  
Ipjang-myeon, Seobuk-gu,  
Cheonan-si, Chungcheongnam-do, 31026  
Republic of Korea

**Product:** Radiant heaters with oil burners  
*INFRARED HEATER*

### Type designation listed on the next page

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. This is to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive 2014/30/EU. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to the a.m. Directive.  
This is not an EU-Type Examination Certificate.

**Date:** 2025-08-04

Certification Body



TagSun Park



**TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg**

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**Product:** Radiant heaters with oil burners  
*INFRARED HEATER*

**Tested according to:** EN 55014-1:2017+A11  
EN IEC 55014-1:2021  
EN 55014-2:1997+A1+A2  
EN IEC 55014-2:2021  
EN 61000-3-2:2014  
EN IEC 61000-3-2:2019+A1  
EN 61000-3-3:2013  
EN 61000-3-3:2013+A1+A2

**Identification:** Type Designation

1) HSE-T9700KF, HSH-OT9700KF, TPH-T10000KF, NKH-T10000KF, GRP-T9000KF, THO-9700KF, NDH-8HF,  
HSE-T9700K, HSH-OT9700K, TPH-T10000K, NKH-T10000K,  
GRP-T9000K, THO-9700K, NDH-8H, TIB-09,  
HSR-T9700KF, TPR-TH10000KF, NXR-TH9700KF,  
GTH-R10000KF, THR-10000KF, NDHA-8HF, HSR-T9700K,  
TPR-TH10000K, NXR-TH9700K, GTH-R10000K,  
THR-10000K, NDHA-8H

2) HSE-T11000KF, HSH-OT11000KF, TPH-T12000KF, NKH-T12000KF, GRP-T11000KF, THO-11000KF, NDH-11HF,  
HSE-T11000K, HSH-OT11000K, TPH-T12000K, NKH-T12000K,  
GRP-T11000K, THO-11000K, NDH-11H,  
HSR-T11000KF, TPR-TH12000KF, NXR-TH11000KF,

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EN IEC 55014-2:2021  
EN 61000-3-2:2014  
EN IEC 61000-3-2:2019+A1  
EN 61000-3-3:2013  
EN 61000-3-3:2013+A1+A2

**Identification:**

Type Designation

GTH-R12000KF, THR-12000KF, NDHA-11HF,  
HSR-T11000K, TPR-TH12000K, NXR-TH11000K,  
GTH-R12000K, THR-12000K, NDHA-11H

3) HSE-T13500KF, HSH-OT13500KF, TPH-T14000KF,  
NKH-T14000KF, GRP-T130000KF, THO-13500KF,  
NDH-13HF,  
HSE-T13500K, HSH-OT13500K, TPH-T14000K, NKH-  
T14000K,  
GRP-T130000K, THO-13500K, NDH-13H, WD46IK,  
HSR-T13500KF, TPR-TH14000KF, NXR-TH13500KF,  
GTH-R14000KF, THR-14000KF, NDHA-13HF,  
HSR-T13500K, TPR-TH14000K, NXR-TH13500K,  
GTH-R14000K, THR-14000K, NDHA-13H

4) HSE-T15500KF, HSH-OT15500KF, TPH-T16000KF,  
NKH-T16000KF, GRP-T15000KF, THO-15500KF,  
NDH-16HF,  
HSE-T15500K, HSH-OT15500K, TPH-T16000K, NKH-  
T16000K,

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EN IEC 55014-1:2021  
EN 55014-2:1997+A1+A2  
EN IEC 55014-2:2021  
EN 61000-3-2:2014  
EN IEC 61000-3-2:2019+A1  
EN 61000-3-3:2013  
EN 61000-3-3:2013+A1+A2

**Identification:** Type Designation

GRP-T15000K, THO-15500K, NDH-16H, WD56IK,  
TIB-16,  
HSR-T15500KF, TPR-TH16000KF, NXR-TH15500KF,  
GTH-R16000KF, THR-16000KF, NDHA-16HF,  
HSR-T15500K, TPR-TH16000K, NXR-TH15500K,  
GTH-R16000K, THR-16000K, NDHA-16H

5) HSE-T17000KF, HSH-OT17000KF, TPH-T18000KF,  
NKH-T18000KF, GRP-T17000KF, THO-17000KF,  
NDH-18HF,  
HSE-T17000K, HSH-OT17000K, TPH-T18000K, NKH-  
T18000K,  
GRP-T17000K, THO-17000K, NDH-18H, WD74IK,  
HSR-T17000KF, TPR-TH18000KF, NXR-TH17000KF,  
GTH-R18000KF, THR-18000KF, NDHA-18HF,  
HSR-T17000K, TPR-TH18000K, NXR-TH17000K,  
GTH-R18000K, THR-18000K, NDHA-18H

6) HSE-T21400KF, HSH-OT21400KF, TPH-T22000KF,

**TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg**

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EN 55014-2:1997+A1+A2  
EN IEC 55014-2:2021  
EN 61000-3-2:2014  
EN IEC 61000-3-2:2019+A1  
EN 61000-3-3:2013  
EN 61000-3-3:2013+A1+A2

**Identification:** Type Designation  
NKH-T22000KF, GRP-T21000KF, THO-21400KF,  
NDH-21HF,  
HSE-T21400K, HSH-OT21400K, TPH-T22000K, NKH-  
T22000K,  
GRP-T21000K, THO-21400K, NDH-21H, TIB-22,  
HSR-T21400KF, TPR-TH22000KF, NXR-TH21400KF,  
GTH-R22000KF, THR-22000KF, NDHA-21HF,  
HSR-T21400K, TPR-TH22000K, NXR-TH21400K,  
GTH-R22000K, THR-22000K, NDHA-21H



**TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg**

|  |   |   |              |  |
|--|---|---|--------------|--|
| <b>Test report no.:</b><br><i>Prüfbericht-Nr.:</i>                 | KR25EYYB 001  | <b>Order No.:</b><br><i>Auftragsnr.:</i>    | 156171372 20 | <b>Page 1 of 13</b><br><i>Seite 1 von 13</i> |
| <b>Client reference no.:</b><br><i>Kunden-Referenz-Nr.:</i>        | 2681770   | <b>Order date:</b><br><i>Auftragsdatum:</i> | 2025-06-09   |  |
| <b>Client:</b><br><i>Auftraggeber:</i>                             | HANSOL ELECTRONICS CO.,LTD<br>180-28, Yeongok-gil, Ipjang-myeon, Seobuk-gu, Cheonan-si, Chungcheongnam-do,<br>31026, Republic of Korea  |   |              |  |
| <b>Test item:</b><br><i>Prüfgegenstand:</i>                        | INFRARED HEATER   |   |              |  |
| <b>Identification / Type no.:</b><br><i>Bezeichnung / Typ-Nr.:</i> | <p>1) HSE-T9700KF, HSH-OT9700KF, TPH-T10000KF, NKH-T10000KF, GRP-T9000KF, THO-9700KF, NDH-8HF, HSE-T9700K, HSH-OT9700K, TPH-T10000K, NKH-T10000K, GRP-T9000K, THO-9700K, NDH-8H, TIB-09, HSR-T9700KF, TPR-TH10000KF, NXR-TH9700KF, GTH-R10000KF, THR-10000KF, NDHA-8HF, HSR-T9700K, TPR-TH10000K, NXR-TH9700K, GTH-R10000K, THR-10000K, NDHA-8H</p> <p>2) HSE-T11000KF, HSH-OT11000KF, TPH-T12000KF, NKH-T12000KF, GRP-T11000KF, THO-11000KF, NDH-11HF, HSE-T11000K, HSH-OT11000K, TPH-T12000K, NKH-T12000K, GRP-T11000K, THO-11000K, NDH-11H, HSR-T11000KF, TPR-TH12000KF, NXR-TH11000KF, GTH-R12000KF, THR-12000KF, NDHA-11HF, HSR-T11000K, TPR-TH12000K, NXR-TH11000K, GTH-R12000K, THR-12000K, NDHA-11H</p> <p>3) HSE-T13500KF, HSH-OT13500KF, TPH-T14000KF, NKH-T14000KF, GRP-T130000KF, THO-13500KF, NDH-13HF, HSE-T13500F, HSH-OT13500K, TPH-T14000K, NKH-T14000K, GRP-T130000K, THO-13500K, NDH-13H, WD46IK, HSR-T13500KF, TPR-TH14000KF, NXR-TH13500KF, GTH-R14000KF, THR-14000KF, NDHA-13HF, HSR-T13500K, TPR-TH14000K, NXR-TH13500K, GTH-R14000K, THR-14000K, NDHA-13H</p> <p>4) HSE-T15500KF, HSH-OT15500KF, TPH-T16000KF, NKH-T16000KF, GRP-T15000KF, THO-15500KF, NDH-16HF, HSE-T15500K, HSH-OT15500K, TPH-T16000K, NKH-T16000K, GRP-T15000K, THO-15500K, NDH-16H, WD56IK, TIB-16, HSR-T15500KF, TPR-TH16000KF, NXR-TH15500KF, GTH-R16000KF, THR-16000KF, NDHA-16HF, HSR-T15500K, TPR-TH16000K, NXR-TH15500K, GTH-R16000K, THR-16000K, NDHA-16H</p> <p>5) HSE-T17000KF, HSH-OT17000KF, TPH-T18000KF, NKH-T18000KF, GRP-T17000KF, THO-17000KF, NDH-18HF, HSE-T17000K, HSH-OT17000K, TPH-T18000K, NKH-T18000K, GRP-T17000K, THO-17000K, NDH-18H, WD74IK, HSR-T17000KF, TPR-TH18000KF, NXR-TH17000KF, GTH-R18000KF, THR-18000KF, NDHA-18HF, HSR-T17000K, TPR-TH18000K, NXR-TH17000K, GTH-R18000K, THR-18000K, NDHA-18H</p> <p>6) HSE-T21400KF, HSH-OT21400KF, TPH-T22000KF, NKH-T22000KF, GRP-T21000KF, THO-21400KF, NDH-21HF, HSE-T21400K, HSH-OT21400K, TPH-T22000K, NKH-T22000K, GRP-T21000K, THO-21400K, NDH-21H, TIB-22, HSR-T21400KF, TPR-TH22000KF, NXR-TH21400KF, GTH-R22000KF, THR-22000KF, NDHA-21HF, HSR-T21400K, TPR-TH22000K, NXR-TH21400K, GTH-R22000K, THR-22000K, NDHA-21H</p> |   |              |  |

|   |   |  |  |
|---|---|--|--|
| <b>Order content:</b><br><i>Auftrags-Inhalt:</i>  | CE EMCD   |  |  |
| <b>Test specification</b><br><i>Prüfgrundlage:</i>  | EN 55014-1:2017+A11:2020<br>EN IEC 55014-1:2021(*)<br>EN 55014-2:1997+A1:2001+A2:2008 (Category II)<br>EN IEC 55014-2:2021 (Category II)(*)<br>EN 61000-3-2:2014<br>EN IEC 61000-3-2:2019+A1:2021(*)<br>EN 61000-3-3:2013<br>EN 61000-3-3:2013+A1:2019+A2:2021(*) |  |  |
| <b>Date of sample receipt:</b><br><i>Wareneingangdatum:</i>   | N/A   |  |  |
| <b>Test sample no:</b><br><i>Prüfmuster-Nr.:</i>  | N/A   |  |  |
| <b>Testing period:</b><br><i>Prüfzeitraum:</i>  | 2025-07-04 - 2025-07-09   |  |  |
| <b>Place of testing:</b><br><i>Ort der Prüfung:</i>   | Dt&C Co., Ltd.  |  |  |
| <b>Testing laboratory:</b><br><i>Prüflaboratorium:</i>  | TÜV Rheinland Korea Ltd.  |  |  |
| <b>Test result*:</b><br><i>Prüfergebnis*:</i>   | Pass  |  |  |
| <b>tested by:</b><br><i>geprüft von:</i>  |   | <b>authorized by:</b><br><i>genehmigt von:</i>                                     |  |
| <b>Date:</b> 2025-07-30<br><i>Datum:</i>  | Seung-Hyun Lee  | <b>Issue date:</b> 2025-07-30<br><i>Ausstellungsdatum:</i>                         | Su-Yeon Choi   |
| <b>Position / Stellung:</b>   | Expert/Sachverständige(r)   | <b>Position / Stellung:</b>  | Expert/Sachverständige(r)  |
| <b>Other:</b><br><i>Sonstiges:</i>  | Detail test results and testing period are described in attached<br>EMC test report DREKCEE2507-0230 (89 pages, issued date 2025-07-25) of Dt&C Co., Ltd.<br>(*) These standards were additional requested by client.   |  |  |
| <b>Condition of the test item at delivery:</b><br><i>Zustand des Prüfgegenstandes bei Anlieferung:</i>  | Test item complete and undamaged<br>Prüfmuster vollständig und unbeschädigt   |  |  |
| * Legend:   | P(ass) = passed a.m. test specification(s)  | F(ail) = failed a.m. test specification(s)   | N/A = not applicable      N/T = not tested   |
| * Legende:  | P(ass) = entspricht o.g. Prüfgrundlage(n)   | F(ail) = entspricht nicht o.g. Prüfgrundlage(n)                                    | N/A = nicht anwendbar      N/T = nicht getestet                                      |
| <p><b>This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</b><br/> <i>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</i></p> |   |  |  |

TÜV Rheinland Korea Ltd. 2F, N-Tower, Semicolon Mullaee, 25, Mullaee-ro 28-gil, Yeongdeungpo-gu, Seoul, 07298, Republic of Korea  
 Mail: [info@kor.tuv.com](mailto:info@kor.tuv.com) · Web: [www.kor.tuv.com](http://www.kor.tuv.com)

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**Remarks**  
*Anmerkungen*

- |   |  |
|---|--|
| 1 | <p>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</p> <p><i>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfbedingungen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</i></p>   |
| 2 | <p>As contractually agreed, this document has been signed digitally only. TÜV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TÜV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. For information on verifying the authenticity of our documents, please visit the following website: <a href="http://go.tuv.com/digital-signature">go.tuv.com/digital-signature</a></p> <p><i>Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben. Informationen zur Verifizierung der Authentizität unserer Dokumente erhalten Sie auf folgender Webseite: <a href="http://go.tuv.com/digital-signature">go.tuv.com/digital-signature</a></i></p> |
| 3 | <p>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</p> <p><i>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</i></p>  |
| 4 | <p>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2023, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</p> <p><i>Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2023, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019..</i></p>  |

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**Revisions**  
*die Überarbeitung*

| Report No.   | Issue date | Change / Remarks  |
|--------------|------------|-------------------|
| KR25EYYB 001 | 2025-07-30 | Original document |
|              |            |                   |

## 1. General Remarks

### 1.1 Test Summary and Result

| Test  | Specifications   | Result |
|---|------------------|--------|
| Emission:<br>EN 55014-1:2017+A11:2020<br>EN IEC 55014-1:2021 <small>Note 1)</small><br>EN 61000-3-2:2014<br>EN IEC 61000-3-2:2019 +A1:2021 <small>Note 1)</small><br>EN 61000-3-3:2013<br>EN 61000-3-3:2013+A1:2019+A2:2021 <small>Note 1)</small><br>Detail test results and testing period are described in attached EMC test DREKCEE2507-0230 (89 pages, issued date 2025-07-25) of Dt&C Co., Ltd. |                  |        |
| EN 55014-1:2017+A11:2020<br>EN IEC 55014-1:2021 <small>Note 1)</small>  | 150 kHz to 1 GHz | Pass   |
| EN 61000-3-2:2014<br>EN IEC 61000-3-2:2019+A1:2021 <small>Note 1)</small>   | Class A          | Pass   |
| EN 61000-3-3:2013<br>EN 61000-3-3:2013+A1:2019+A2:2021 <small>Note 1)</small>   | -                | Pass   |
| Immunity:<br>EN 55014-2:1997+A1:2001+A2:2008<br>EN IEC 55014-2:2021 <small>Note 1)</small><br>Detail test results and testing period are described in attached EMC test report DREKCEE2507-0230 (89 pages, issued date 2025-07-25) of Dt&C Co., Ltd.  |                  |        |
| EN 55014-2:1997+A1:2001+A2:2008<br>EN IEC 55014-2:2021 <small>Note 1)</small>   | Category II      | Pass   |

Note 1) These standards were additional requested by client.

### 1.2 Test Report Purpose

The purpose of this test report is to show compliance of the EUT (Equipment Under Test) with the requirements of harmonized standards for the EMC Directive (2014/30/EU) and of other standards listed in section 1.1.

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## 2. Test Sites

### 2.1 Test Facilities

Dt &C Co., Ltd.

42, Yurim-ro, 154 beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea (with accredited no. KOLAS: KT393)

### 2.2 List of Test and Measurement Instruments

Refer to the attached test report:

DREKCEE2507-0230 (89 pages, issued date 2025-07-25) of Dt&C Co., Ltd.

### 2.3 Measurement Uncertainty

Refer to the attached test report:

DREKCEE2507-0230 (89 pages, issued date 2025-07-25) of Dt&C Co., Ltd.

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### 3. General Product Information

#### 3.1 Product Function and Intended Use

The EUT(Equipment Under Test) HSE-T21400KF is Infrared Heater for household use.

#### 3.2 Ratings and System Details

System Input Voltage: 220-230 V~

Frequency: 50 Hz

Serial No.: Pre-device

Test Voltage, Frequency and more details, refer to the attached test report (European rated supply 230 V, 50 Hz was selected representatively),:

DREKCEE2507-0230 (89 pages, issued date 2025-07-25) of Dt&C Co., Ltd.

#### 3.3 Noise Generating and Noise Suppressing Parts

The highest frequency generated or used by the EUT is below 8 MHz

More details, refer to the attached test report:

DREKCEE2507-0230 (89 pages, issued date 2025-07-25) of Dt&C Co., Ltd.

#### 3.4 Submitted Documents and Information

Following documents have been submitted by the client:

- Draft manual by HANSOL ELECTRONICS CO.,LTD
- Rating Label by HANSOL ELECTRONICS CO.,LTD
- DREKCEE2507-0230 (89 pages, issued date 2025-07-25) of Dt&C Co., Ltd.

Following information provided in this test report has been submitted by the client:

- HANSOL ELECTRONICS CO.,LTD  
180-28, Yeongok-gil, Ipjang-myeon, Seobuk-gu, Cheonan-si, Chungcheongnam-do, 31026, Republic of Korea
- 1), 2), 3), 4) : 220-230 V~, 50 Hz, 40 W or 70 W (with Fan), 0.2 A or 0.4 A (with Fan), Class I
- 5), 6) : 220-230 V~, 50 Hz, 60 W or 90 W (with Fan), 0.3 A or 0.5 A (with Fan), Class I

#### 3.5 Model differences

##### Model difference:

| No. | Model   | Power consumption, Current | Fan motor | Enclosure type | Product size (mm) (WxDxH), Weight | Heating capacity |
|-----|---|----------------------------|-----------|----------------|-----------------------------------|------------------|
| 1)  | HSE-T9700KF, HSH-OT9700KF, TPH-T10000KF, NKH-T10000KF, GRP-T9000KF, THO-9700KF, NDH-8HF | 70 W<br>0.4 A              | O         | Square type    | 760x343x948<br>40 kg              | 9.77 kW          |

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|    |   |               |   |                |                           |          |
|----|---|---------------|---|----------------|---------------------------|----------|
|    | HSR-T9700KF, TPR-TH10000KF,<br>NXR-TH9700KF, GTH-R10000KF,<br>THR-10000KF, NDHA-8HF                     | 70 W<br>0.4 A | O | Round<br>type  | 760x343x<br>948<br>40 kg  | 9.77 kW  |
|    | HSE-T9700K, HSH-OT9700K,<br>TPH-T10000K, NKH-T10000K,<br>GRP-T9000K, THO-9700K, NDH-8H,<br>TIB-09       | 40 W<br>0.2 A | X | Square<br>type | 760x309x<br>948<br>37 kg  | 9.77 kW  |
|    | HSR-T9700K, TPR-TH10000K,<br>NXR-TH9700K, GTH-R10000K,<br>THR-10000K, NDHA-8H                           | 40 W<br>0.2 A | X | Round<br>type  | 760x309x<br>948<br>37 kg  | 9.77 kW  |
| 2) | HSE-T11000KF, HSH-OT11000KF,<br>TPH-T12000KF, NKH-T12000KF,<br>GRP-T11000KF, THO-11000KF,<br>NDH-11HF   | 70 W<br>0.4 A | O | Square<br>type | 760x343x<br>1028<br>45 kg | 10.74 kW |
|    | HSR-T11000KF, TPR-TH12000KF,<br>NXR-TH11000KF, GTH-R12000KF,<br>THR-12000KF, NDHA-11HF                  | 70 W<br>0.4 A | O | Round<br>type  | 760x343x<br>1028<br>45 kg | 10.74 kW |
|    | HSE-T11000K, HSH-OT11000K,<br>TPH-T12000K, NKH-T12000K,<br>GRP-T11000K, THO-11000K, NDH-11H             | 40 W<br>0.2 A | X | Square<br>type | 760x310x<br>1028<br>42 kg | 10.74 kW |
|    | HSR-T11000K, TPR-TH12000K,<br>NXR-TH11000K, GTH-R12000K,<br>THR-12000K, NDHA-11H                        | 40 W<br>0.2 A | X | Round<br>type  | 760x310x<br>1028<br>42 kg | 10.74 kW |
| 3) | HSE-T13500KF, HSH-OT13500KF,<br>TPH-T14000KF, NKH-T14000KF,<br>GRP-T130000KF, THO-13500KF,<br>NDH-13HF  | 70 W<br>0.4 A | O | Square<br>type | 940x344x<br>1028<br>45 kg | 13.46 kW |
|    | HSR-T13500KF, TPR-TH14000KF,<br>NXR-TH13500KF, GTH-R14000KF,<br>THR-14000KF, NDHA-13HF                  | 70 W<br>0.4 A | O | Round<br>type  | 940x344x<br>1028<br>45 kg | 13.46 kW |
|    | HSE-T13500K, HSH-OT13500K,<br>TPH-T14000K, NKH-T14000K,<br>GRP-T130000K, THO-13500K,<br>NDH-13H, WD46IK | 40 W<br>0.2 A | X | Square<br>type | 940x310x<br>1028<br>42 kg | 13.46 kW |

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|    |   |               |   |                |                            |          |
|----|---|---------------|---|----------------|----------------------------|----------|
|    | HSR-T13500K, TPR-TH14000K,<br>NXR-TH13500K, GTH-R14000K,<br>THR-14000K, NDHA-13H                                | 40 W<br>0.2 A | X | Round<br>type  | 940x310x<br>1028<br>42 kg  | 13.46 kW |
| 4) | HSE-T15500KF, HSH-OT15500KF,<br>TPH-T16000KF, NKH-T16000KF,<br>GRP-T15000KF, THO-15500KF,<br>NDH-16HF           | 70 W<br>0.4 A | O | Square<br>type | 1028x344<br>x1028<br>57 kg | 15.52 kW |
|    | HSR-T15500KF, TPR-TH16000KF,<br>NXR-TH15500KF, GTH-R16000KF,<br>THR-16000KF, NDHA-16HF                          | 70 W<br>0.4 A | O | Round<br>type  | 1028x344<br>x1028<br>57 kg | 15.52 kW |
|    | HSE-T15500K, HSH-OT15500K,<br>TPH-T16000K, NKH-T16000K,<br>GRP-T15000K, THO-15500K, NDH-<br>16H, WD56IK, TIB-16 | 40 W<br>0.2 A | X | Square<br>type | 1028x310<br>x1028<br>54 kg | 15.52 kW |
|    | HSR-T15500K, TPR-TH16000K,<br>NXR-TH15500K, GTH-R16000K,<br>THR-16000K, NDHA-16H                                | 40 W<br>0.2 A | X | Round<br>type  | 1028x310<br>x1028<br>54 kg | 15.52 kW |
| 5) | HSE-T17000KF, HSH-OT17000KF,<br>TPH-T18000KF, NKH-T18000KF,<br>GRP-T17000KF, THO-17000KF,<br>NDH-18HF           | 90 W<br>0.5 A | O | Square<br>type | 1028x344<br>x1286<br>65 kg | 17.13 kW |
|    | HSR-T17000KF, TPR-TH18000KF,<br>NXR-TH17000KF, GTH-R18000KF,<br>THR-18000KF, NDHA-18HF                          | 90 W<br>0.5 A | O | Round<br>type  | 1028x344<br>x1286<br>65 kg | 17.13 kW |
|    | HSE-T17000K, HSH-OT17000K,<br>TPH-T18000K, NKH-T18000K,<br>GRP-T17000K, THO-17000K,<br>NDH-18H, WD74IK          | 60 W<br>0.3 A | X | Square<br>type | 1028x310<br>x1217<br>61 kg | 17.13 kW |
|    | HSR-T17000K, TPR-TH18000K,<br>NXR-TH17000K, GTH-R18000K,<br>THR-18000K, NDHA-18H                                | 60 W<br>0.3 A | X | Round<br>type  | 1028x310<br>x1217<br>61 kg | 17.13 kW |
| 6) | HSE-T21400KF, HSH-OT21400KF,<br>TPH-T22000KF, NKH-T22000KF,<br>GRP-T21000KF, THO-21400KF,<br>NDH-21HF           | 90 W<br>0.5 A | O | Square<br>type | 1350x394<br>x1416<br>90 kg | 21.48 kW |

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|  |               |   |                |                            |          |
|--|---------------|---|----------------|----------------------------|----------|
| HSR-T21400KF, TPR-TH22000KF,<br>NXR-TH21400KF, GTH-R22000KF,<br>THR-22000KF, NDHA-21HF                 | 90 W<br>0.5 A | O | Round<br>type  | 1350x394<br>x1416<br>90 kg | 21.48 kW |
| HSE-T21400K, HSH-OT21400K,<br>TPH-T22000K, NKH-T22000K,<br>GRP-T21000K, THO-21400K,<br>NDH-21H, TIB-22 | 60 W<br>0.3 A | X | Square<br>type | 1350x370<br>x1416<br>85 kg | 21.48 kW |
| HSR-T21400K, TPR-TH22000K,<br>NXR-TH21400K, GTH-R22000K,<br>THR-22000K, NDHA-21H                       | 60 W<br>0.3 A | X | Round<br>type  | 1350x370<br>x1416<br>85 kg | 21.48 kW |

### 3.6 Summary of testing

Production sample without serial no. was tested.

Since the circuit configuration of all series are same, the model HSE-T21400KF was tested output rating max. condition as the representative model, the most unfavourable results were written in this report and fulfilled the test specifications.

## 4. Test Setup and Operation Modes

### 4.1 Principle of Configuration Selection

#### Emission:

The equipment under test(EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instruction for use.

#### Immunity:

The equipment under test(EUT) was configured to measure its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the instruction for use.

### 4.2 Operation Modes

The operation mode used for testing is:

A. Normal Operation

More details, refer to the attached test report:

DREKCEE2507-0230 (89 pages, issued date 2025-07-25) of Dt&C Co., Ltd.

### 4.3 Physical Configuration for Testing

Refer to the attached test report:

DREKCEE2507-0230 (89 pages, issued date 2025-07-25) of Dt&C Co., Ltd.

### 4.4 Test Software

Refer to the attached test report:

DREKCEE2507-0230 (89 pages, issued date 2025-07-25) of Dt&C Co., Ltd.

### 4.5 Special Accessories and Auxiliary Equipment

Refer to the attached test report:

DREKCEE2507-0230 (89 pages, issued date 2025-07-25) of Dt&C Co., Ltd.

### 4.6 Countermeasures to achieve Compliance

No additional measures were employed to achieve compliance.

#### 4.7 Performance Criteria for Immunity Testing

| Description of Performance Criteria |   |
|-------------------------------------|---|
| <b>Criteria A</b>                   | <p>The apparatus shall continue to operate as intended during the test.</p> <p>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.</p>   |
| <b>Criteria B</b>                   | <p>The apparatus shall continue to operate as intended after the test.</p> <p>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 to persist after the test. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.</p> |
| <b>Criteria C</b>                   | <p>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.</p>   |

## 5. Documentation Requirements

Following documents inspected::

- Draft manual by HANSOL ELECTRONICS CO.,LTD
- Rating Label by HANSOL ELECTRONICS CO.,LTD

### 5.1 Documentation Requirements

| No. | Item                                   | Requirement   | Result | Remarks          |
|-----|--|---|--------|------------------|
| 1.  | Cable Specification and Classification | EN 55014-1, clause 6<br><br>The user documentation and/or manual shall contain details of any special measures required to be taken by the purchaser or user to ensure EMC compliance of the Product. | P      | Refer to manual. |

### 5.2 Documentation Requirements of EMCD 2014/30/EU

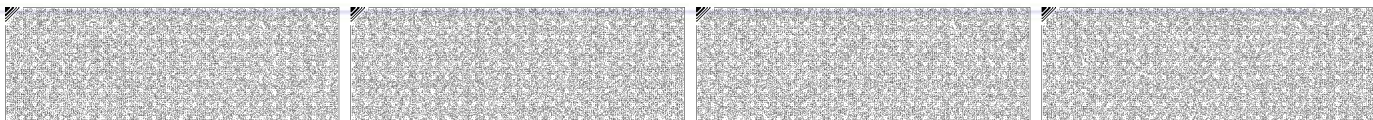
| No. | Item                     | Requirement   | Result | Remarks                         |
|-----|--------------------------|---|--------|---------------------------------|
| 1.  | Apparatus Identification | EMCD 2014/30/EU, article 7(5)<br><br>Manufacturers shall ensure that apparatus which they have placed on the market bear a type, batch or serial number or other element allowing their identification, or, where the size or nature of the apparatus does not allow it, that the required information is provided on the packaging or in a document accompanying the apparatus.<br><br>EMCD 2014/30/EU, article 7(6)<br><br>Manufacturers shall indicate, on the apparatus, their name, registered trade name or registered trade mark and the postal address at which they can be contacted or, where that is not possible, on its packaging or in a document accompanying the apparatus. The address shall indicate a single point at which the manufacturer can be contacted. The contact details shall be in a language easily understood by end-users and market surveillance authorities | P      | Refer to label and draft manual |



# TEST REPORT

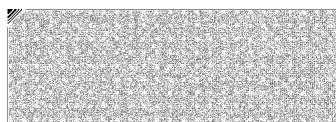
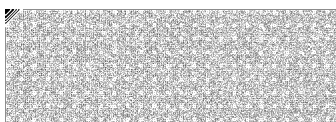
|  |  |  |                                |                     |                       |                                     |                     |                                  |   |                     |                                |  |                       |  |                     |  |
|--|--|--|--------------------------------|---------------------|-----------------------|-------------------------------------|---------------------|----------------------------------|---|---------------------|--------------------------------|--|-----------------------|--|---------------------|--|
|  | <p><b>Dt&amp;C Co., Ltd.</b><br/>42, Yurim-ro, 154 beon-gil, Cheoin-gu, Yongin-si,<br/>Gyeonggi-do, Korea<br/>Tel : 031-321-2664, Fax : 031-321-1664</p> |  |                                |                     |                       |                                     |                     |                                  |   |                     |                                |  |                       |  |                     |  |
| <p>1. Report No : DREKCEE2507-0230</p> <p>2. Customer</p> <ul style="list-style-type: none"> <li>Name : HANSOLELECTRONICS Co.,Ltd.</li> <li>Address : 180-28, Yeongok-gil, Ipjang-myeon, Seobuk-gu, Cheonan-si, Chungcheongnam-do, I of Korea</li> </ul> <p>3. Use of Report : CE Approval</p> <p>4. Product Name / Model Name : Infrared Heater / HSE-T21400KF</p> <p>5. Test Method Used :</p> <table border="0"> <tr> <td>EN 55014-1 : 2017 + A11 : 2020</td> <td>EN 61000-3-2 : 2014</td> </tr> <tr> <td>EN IEC 55014-1 : 2021</td> <td>EN IEC 61000-3-2 : 2019 + A1 : 2021</td> </tr> <tr> <td>(CISPR 14-1 : 2020)</td> <td>IEC 61000-3-2 : 2018 + A1 : 2020</td> </tr> <tr> <td>EN 55014-2 : 1997 + A1 : 2001 + A2 : 2008</td> <td>EN 61000-3-3 : 2013</td> </tr> <tr> <td>*EN 55014-2 : 1997 / AC : 1997</td> <td>*EN 61000-3-3 : 2013 + A1 : 2019 + A2 : 2021</td> </tr> <tr> <td>EN IEC 55014-2 : 2021</td> <td>IEC 61000-3-3 : 2013 + AMD1 : 2017 + AMD2 : 2021</td> </tr> <tr> <td>(CISPR 14-2 : 2020)</td> <td></td> </tr> </table> <p>6. Date of Test : Jul. 04. 2025 ~ Jul. 09. 2025</p> <p>7. Location of Test : <input checked="" type="checkbox"/> Permanent Testing Lab      <input type="checkbox"/> On Site Testing<br/>(Address : Refer to the attached)</p> <p>8. Testing Environment : Temperature (21 ~ 24) °C , Humidity (53 ~ 54) % R.H.</p> <p>9. Test Result : Refer to the attached Test Result</p> <p>The results shown in this test report refer only to the sample(s) tested unless otherwise stated.<br/>This laboratory is not accredited for the test results marked. " * "</p> |  |  | EN 55014-1 : 2017 + A11 : 2020 | EN 61000-3-2 : 2014 | EN IEC 55014-1 : 2021 | EN IEC 61000-3-2 : 2019 + A1 : 2021 | (CISPR 14-1 : 2020) | IEC 61000-3-2 : 2018 + A1 : 2020 | EN 55014-2 : 1997 + A1 : 2001 + A2 : 2008 | EN 61000-3-3 : 2013 | *EN 55014-2 : 1997 / AC : 1997 | *EN 61000-3-3 : 2013 + A1 : 2019 + A2 : 2021 | EN IEC 55014-2 : 2021 | IEC 61000-3-3 : 2013 + AMD1 : 2017 + AMD2 : 2021 | (CISPR 14-2 : 2020) |  |
| EN 55014-1 : 2017 + A11 : 2020   | EN 61000-3-2 : 2014  |  |                                |                     |                       |                                     |                     |                                  |   |                     |                                |  |                       |  |                     |  |
| EN IEC 55014-1 : 2021  | EN IEC 61000-3-2 : 2019 + A1 : 2021  |  |                                |                     |                       |                                     |                     |                                  |   |                     |                                |  |                       |  |                     |  |
| (CISPR 14-1 : 2020)  | IEC 61000-3-2 : 2018 + A1 : 2020   |  |                                |                     |                       |                                     |                     |                                  |   |                     |                                |  |                       |  |                     |  |
| EN 55014-2 : 1997 + A1 : 2001 + A2 : 2008  | EN 61000-3-3 : 2013  |  |                                |                     |                       |                                     |                     |                                  |   |                     |                                |  |                       |  |                     |  |
| *EN 55014-2 : 1997 / AC : 1997   | *EN 61000-3-3 : 2013 + A1 : 2019 + A2 : 2021   |  |                                |                     |                       |                                     |                     |                                  |   |                     |                                |  |                       |  |                     |  |
| EN IEC 55014-2 : 2021  | IEC 61000-3-3 : 2013 + AMD1 : 2017 + AMD2 : 2021   |  |                                |                     |                       |                                     |                     |                                  |   |                     |                                |  |                       |  |                     |  |
| (CISPR 14-2 : 2020)  |  |  |                                |                     |                       |                                     |                     |                                  |   |                     |                                |  |                       |  |                     |  |
| Affirmation  | <p>Tested by</p> <p>Name : UkHyeon Kwon </p>   | <p>Technical Manager</p> <p>Name : JunHo Park </p> |                                |                     |                       |                                     |                     |                                  |   |                     |                                |  |                       |  |                     |  |
| <p>The above test report is the accredited test result by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.</p>  |  |  |                                |                     |                       |                                     |                     |                                  |   |                     |                                |  |                       |  |                     |  |
| <p style="text-align: center;"><b>Jul. 25. 2025</b></p> <p style="text-align: center;"><b>Dt&amp;C Co., Ltd.</b><br/>Accredited by KOLAS, Republic of KOREA</p>  |  |  |                                |                     |                       |                                     |                     |                                  |   |                     |                                |  |                       |  |                     |  |

If this report is required to confirmation of authenticity, please contact to [report@dtnc.net](mailto:report@dtnc.net)



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## 1. General Remarks

This report contains the result of tests performed by :

### Dt&C Co., Ltd.

42, Yurim-ro, 154 beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea

<http://www.dtnc.net>

Tel: +82-31-321-2664 Fax: +82-31-321-1664

## 2. Test Laboratory

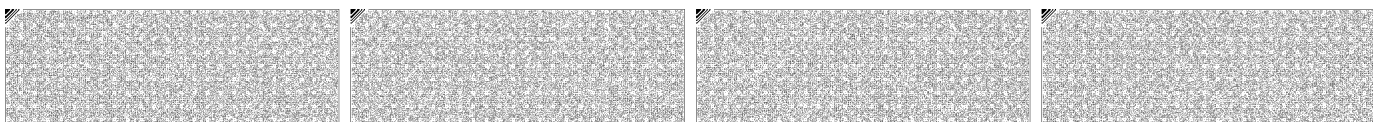
### Address of Laboratory

|                                     |                        |  |
|-------------------------------------|------------------------|--|
| <input checked="" type="checkbox"/> | Branch site-1          | 46, Yurim-ro 154 beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea      |
| <input type="checkbox"/>            | Satellite facilities-1 | 42, Yurim-ro 154 beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea      |
| <input type="checkbox"/>            | Satellite facilities-3 | 38, Yurim-ro 154 beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea      |
| <input type="checkbox"/>            | Satellite facilities-4 | 28, Baengnyeong-ro 20 beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea |

Dt&C Co., Ltd. has been accredited / filed / authorized by the agencies listed in the following table;

| Certificate   | Nation       | Agency | Code   | Remark        |
|---------------|--------------|--------|--|---------------|
| Accreditation | Korea        | KOLAS  | 393  | ISO/IEC 17025 |
|               | South Africa | SABS   | 0006   | ISO/IEC 17025 |
|               | Ghana        | NCA    | NCA agreement<br>23 <sup>rd</sup> , Oct, 2018  | -             |
| Site Filing   | USA          | FCC    | KR0034   | Designation   |
|               | Canada       | IC     | KR0034   | Designation   |
|               | Japan        | VCCI   | C-11427, R-13385,<br>R-14076, R-14180,<br>R-14496, T-11442,<br>G-10338, G-10754,<br>G-10815, G-20051 | Registered    |
| Certification | Korea        | KC     | KR0034   | Designation   |
|               | Germany      | TUV    | CARAT 089112<br>0012 Rev.00  | ISO/IEC 17025 |
|               | Russia       | RMRS   | 22.03.01.01196.296   | ISO/IEC 17025 |

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competent of calibration and testing laboratory".



### 3. General Information of EUT

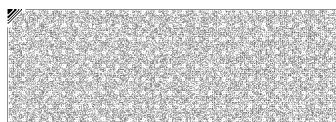
|                      |   |
|----------------------|---|
| Applicant            | HANSOLELECTRONICS Co.,Ltd.<br>180-28, Yeongok-gil, Ipjang-myeon, Seobuk-gu, Cheonan-si,<br>Chungcheongnam-do, Republic of Korea   |
| Manufacturer         | HANSOLELECTRONICS Co.,Ltd.<br>180-28, Yeongok-gil, Ipjang-myeon, Seobuk-gu, Cheonan-si,<br>Chungcheongnam-do, Republic of Korea   |
| Product Name         | Infrared Heater   |
| Model Name           | HSE-T21400KF  |
| Add Model Name       | HSH-OT9700KF, TPH-T10000KF, NKH-T10000KF, GRP-T9000KF, THO-9700KF, NDH-8HF, HSE-T9700K, HSH-OT9700K, TPH-T10000K, NKH-T10000K, GRP-T9000K, THO-9700K, NDH-8H, TIB-09, HSR-T9700KF, TPR-TH10000KF, NXR-TH9700KF, GTH-R10000KF, THR-10000KF, NDHA-8HF, HSR-T9700K, TPR-TH10000K, NXR-TH9700K, GTH-R10000K, THR-10000K, NDHA-8H, HSH-OT11000KF, TPH-T12000KF, NKH-T12000KF, GRP-T11000KF, THO-11000KF, NDH-11HF, HSE-T11000K, HSH-OT11000K, TPH-T12000K, NKH-T12000K, GRP-T11000K, THO-11000K, NDH-11H, HSR-T11000KF, TPR-TH12000KF, NXR-TH11000KF, GTH-R12000KF, THR-12000KF, NDHA-11HF, HSR-T11000K, TPR-TH12000K, NXR-TH11000K, GTH-R12000K, THR-12000K, NDHA-11H, HSH-OT13500KF, TPH-T14000KF, NKH-T14000KF, GRP-T130000KF, THO-13500KF, NDH-13HF, HSE-T13500K, HSH-OT13500K, TPH-T14000K, NKH-T14000K, GRP-T130000K, THO-13500K, NDH-13H, WD46IK, HSR-T13500KF, TPR-TH14000KF, NXR-TH13500KF, GTH-R14000KF, THR-14000KF, NDHA-13HF, HSR-T13500K, TPR-TH14000K, NXR-TH13500K, GTH-R14000K, THR-14000K, NDHA-13H, HSH-OT15500KF, TPH-T16000KF, NKH-T16000KF, GRP-T15000KF, THO-15500KF, NDH-16HF, HSE-T15500K, HSH-OT15500K, TPH-T16000K, NKH-T16000K, GRP-T15000K, THO-15500K, NDH-16H, WD56IK, TIB-16, HSR-T15500KF, TPR-TH16000KF, NXR-TH15500KF, GTH-R16000KF, THR-16000KF, NDHA-16HF, HSR-T15500K, TPR-TH16000K, NXR-TH15500K, GTH-R16000K, THR-16000K, NDHA-16H, HSH-OT17000KF, TPH-T18000KF, NKH-T18000KF, GRP-T17000KF, THO-17000KF, NDH-18HF, HSE-T17000K, HSH-OT17000K, TPH-T18000K, NKH-T18000K, GRP-T17000K, THO-17000K, NDH-18H, WD74IK, HSR-T17000KF, TPR-TH18000KF, NXR-TH17000KF, GTH-R18000KF, THR-18000KF, NDHA-18HF, HSR-T17000K, TPR-TH18000K, NXR-TH17000K, GTH-R18000K, THR-18000K, NDHA-18H, HSH-OT21400KF, TPH-T22000KF, NKH-T22000KF, GRP-T21000KF, THO-21400KF, NDH-21HF, HSE-T21400K, HSH-OT21400K, TPH-T22000K, NKH-T22000K, GRP-T21000K, THO-21400K, NDH-21H, TIB-22, HSR-T21400KF, TPR-TH22000KF, NXR-TH21400KF, GTH-R22000KF, THR-22000KF, NDHA-21HF, HSR-T21400K, TPR-TH22000K, NXR-TH21400K, GTH-R22000K, THR-22000K, NDHA-21H |
| Add Model Difference | Refer to below Note 1)  |



|                            |  |
|----------------------------|--|
| Software Version           | None   |
| Hardware Version           | None   |
| Maximum Internal Frequency | 8 MHz  |
| Classification             | <input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B   |
| Rated Power                | AC 220-230 V, 50 Hz  |
| Classification of EUT      | <input type="checkbox"/> CAT I (Category I)<br><input checked="" type="checkbox"/> CAT II (Category II)<br><input type="checkbox"/> CAT III (Category III)<br><input type="checkbox"/> CAT IV (Category IV)<br><input type="checkbox"/> CAT V (Category V) |
| Remarks                    | None   |

## Buyer Information

|                |  |
|----------------|--|
| Buyer          | TOYOTOMI Co., LTD<br>5-17, MOMOZONO-CHO, MIZUHO-KU, NAGOYA, AICHI, JAPAN |
| Product Name   | Infrared Heater  |
| Model Name     | TIB-22   |
| Add Model Name | TIB-09, TIB-16   |



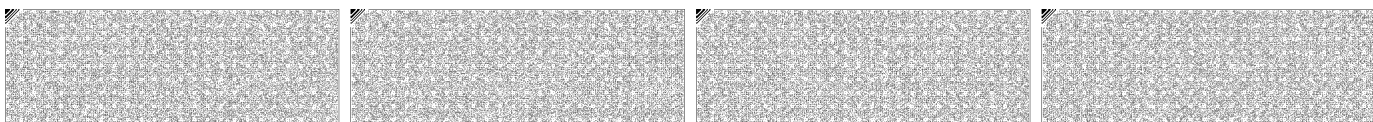
Note 1) Add Model Difference

**Model Differences:**

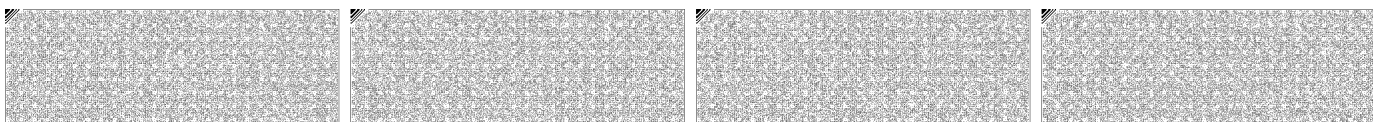
| No. | Model  | Power consumption, Current | Fan motor | Enclosure type | Product size (mm) (WxDxH), Weight | Heating capacity |
|-----|--|----------------------------|-----------|----------------|-----------------------------------|------------------|
| 1)  | HSE-T9700KF, HSH-OT9700KF, TPH-T10000KF, NKH-T10000KF, GRP-T9000KF, THO-9700KF, NDH-8HF      | 70 W<br>0.4 A              | O         | Square type    | 760x343x948<br>40kg               | 9.77 kW          |
|     | HSR-T9700KF, TPR-TH10000KF, NXR-TH9700KF, GTH-R10000KF, THR-10000KF, NDHA-8HF                | 70 W<br>0.4 A              | O         | Round type     | 760x343x948<br>40kg               | 9.77 kW          |
|     | HSE-T9700K, HSH-OT9700K, TPH-T10000K, NKH-T10000K, GRP-T9000K, THO-9700K, NDH-8H, TIB-09     | 40 W<br>0.2 A              | X         | Square type    | 760x309x948<br>37 kg              | 9.77 kW          |
|     | HSR-T9700K, TPR-TH10000K, NXR-TH9700K, GTH-R10000K, THR-10000K, NDHA-8H                      | 40 W<br>0.2 A              | X         | Round type     | 760x309x948<br>37 kg              | 9.77 kW          |
| 2)  | HSE-T11000KF, HSH-OT11000KF, TPH-T12000KF, NKH-T12000KF, GRP-T11000KF, THO-11000KF, NDH-11HF | 70 W<br>0.4 A              | O         | Square type    | 760x343x1028<br>45 kg             | 10.74 kW         |
|     | HSR-T11000KF, TPR-TH12000KF, NXR-TH11000KF, GTH-R12000KF, THR-12000KF, NDHA-11HF             | 70 W<br>0.4 A              | O         | Round type     | 760x343x1028<br>45 kg             | 10.74 kW         |
|     | HSE-T11000K, HSH-OT11000K, TPH-T12000K, NKH-T12000K, GRP-T11000K, THO-11000K, NDH-11H        | 40 W<br>0.2 A              | X         | Square type    | 760x310x1028<br>42 kg             | 10.74 kW         |
|     | HSR-T11000K, TPR-TH12000K, NXR-TH11000K, GTH-R12000K, THR-12000K, NDHA-11H                   | 40 W<br>0.2 A              | X         | Round type     | 760x310x1028<br>42 kg             | 10.74 kW         |

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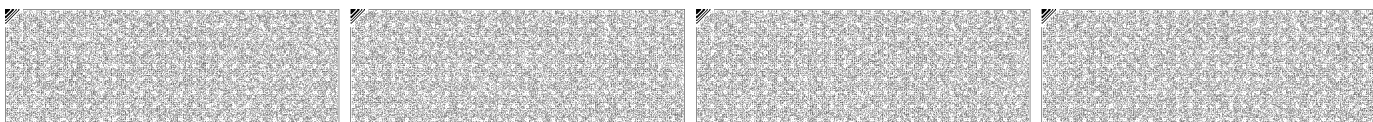
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|    |   |               |   |             |                        |          |
|----|---|---------------|---|-------------|------------------------|----------|
| 3) | HSE-T13500KF, HSH-OT13500KF, TPH-T14000KF, NKH-T14000KF, GRP-T130000KF, THO-13500KF, NDH-13HF         | 70 W<br>0.4 A | O | Square type | 940x344x1028<br>45 kg  | 13.46 kW |
|    | HSR-T13500KF, TPR-TH14000KF, NXR-TH13500KF, GTH-R14000KF, THR-14000KF, NDHA-13HF                      | 70 W<br>0.4 A | O | Round type  | 940x344x1028<br>45 kg  | 13.46 kW |
|    | HSE-T13500K, HSH-OT13500K, TPH-T14000K, NKH-T14000K, GRP-T130000K, THO-13500K, NDH-13H, WD46IK        | 40 W<br>0.2 A | X | Square type | 940x310x1028<br>42 kg  | 13.46 kW |
|    | HSR-T13500K, TPR-TH14000K, NXR-TH13500K, GTH-R14000K, THR-14000K, NDHA-13H                            | 40 W<br>0.2 A | X | Round type  | 940x310x1028<br>42 kg  | 13.46 kW |
| 4) | HSE-T15500KF, HSH-OT15500KF, TPH-T16000KF, NKH-T16000KF, GRP-T15000KF, THO-15500KF, NDH-16HF          | 70 W<br>0.4 A | O | Square type | 1028x344x1028<br>57 kg | 15.52 kW |
|    | HSR-T15500KF, TPR-TH16000KF, NXR-TH15500KF, GTH-R16000KF, THR-16000KF, NDHA-16HF                      | 70 W<br>0.4 A | O | Round type  | 1028x344x1028<br>57 kg | 15.52 kW |
|    | HSE-T15500K, HSH-OT15500K, TPH-T16000K, NKH-T16000K, GRP-T15000K, THO-15500K, NDH-16H, WD56IK, TIB-16 | 40 W<br>0.2 A | X | Square type | 1028x310x1028<br>54 kg | 15.52 kW |
|    | HSR-T15500K, TPR-TH16000K, NXR-TH15500K, GTH-R16000K, THR-16000K, NDHA-16H                            | 40 W<br>0.2 A | X | Round type  | 1028x310x1028<br>54 kg | 15.52 kW |



|    |   |               |   |             |                        |          |
|----|---|---------------|---|-------------|------------------------|----------|
| 5) | HSE-T17000KF, HSH-OT17000KF, TPH-T18000KF, NKH-T18000KF, GRP-T17000KF, THO-17000KF, NDH-18HF  | 90 W<br>0.5 A | O | Square type | 1028x344x1286<br>65 kg | 17.13 kW |
|    | HSR-T17000KF, TPR-TH18000KF, NXR-TH17000KF, GTH-R18000KF, THR-18000KF, NDHA-18HF              | 90 W<br>0.5 A | O | Round type  | 1028x344x1286<br>65 kg | 17.13 kW |
|    | HSE-T17000K, HSH-OT17000K, TPH-T18000K, NKH-T18000K, GRP-T17000K, THO-17000K, NDH-18H, WD74IK | 60 W<br>0.3 A | X | Square type | 1028x310x1217<br>61 kg | 17.13 kW |
|    | HSR-T17000K, TPR-TH18000K, NXR-TH17000K, GTH-R18000K, THR-18000K, NDHA-18H                    | 60 W<br>0.3 A | X | Round type  | 1028x310x1217<br>61 kg | 17.13 kW |
| 6) | HSE-T21400KF, HSH-OT21400KF, TPH-T22000KF, NKH-T22000KF, GRP-T21000KF, THO-21400KF, NDH-21HF  | 90 W<br>0.5 A | O | Square type | 1350x394x1416<br>90 kg | 21.48 kW |
|    | HSR-T21400KF, TPR-TH22000KF, NXR-TH21400KF, GTH-R22000KF, THR-22000KF, NDHA-21HF              | 90 W<br>0.5 A | O | Round type  | 1350x394x1416<br>90 kg | 21.48 kW |
|    | HSE-T21400K, HSH-OT21400K, TPH-T22000K, NKH-T22000K, GRP-T21000K, THO-21400K, NDH-21H, TIB-22 | 60 W<br>0.3 A | X | Square type | 1350x370x1416<br>85 kg | 21.48 kW |
|    | HSR-T21400K, TPR-TH22000K, NXR-TH21400K, GTH-R22000K, THR-22000K, NDHA-21H                    | 60 W<br>0.3 A | X | Round type  | 1350x370x1416<br>85 kg | 21.48 kW |



## 4. EUT Operations and Test Configurations

### 4.1 Principle of Configuration Selection

#### Emission :

The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use. For each testing mode different configurations were used, Refer to the individual tests.

#### Immunity :

The equipment under test (EUT) was configured to have its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the instructions for use. For each testing mode different configurations were used. Refer to the individual tests.

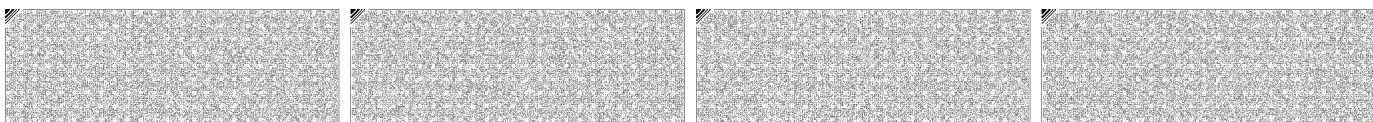
### 4.2 EUT Operation Mode

| No. | Mode   | Description   |
|-----|--------|---|
| 1   | HIGH   | EUT sets its internal circuits to a state where they do not burn fuel or generate heat, and the fans run at high speed.   |
| 2   | MIDDLE | EUT sets its internal circuits to a state where they do not burn fuel or generate heat, and the fans run at middle speed. |

\* Non-conductive supports were not used because the wheel height of the EUT was greater than 10 cm.

### 4.3 Test Configuration Mode

| No. | Mode             | Description                 |
|-----|------------------|-----------------------------|
| 1   | Normal Operation | EUT is powered by AC mains. |



#### 4.4 Supported Equipment

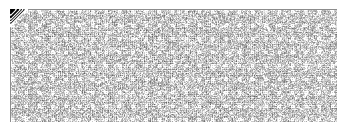
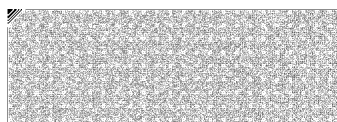
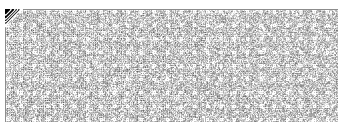
| Used*   | Product Type | Manufacturer | Model | Remarks |
|---|--------------|--------------|-------|---------|
| -   | -            | -            | -     | -       |
| *Abbreviations:<br>AE - Auxiliary/Associated Equipment, or<br>SIM - Simulator |              |              |       |         |

#### 4.5 EUT In/Output Port

| Name   | Type* | Cable Max. >3m | Cable Shielded | Remarks |
|--|-------|----------------|----------------|---------|
| AC MAINS   | AC    | 1.7            | Non-Shielded   | None    |
| *Abbreviations:<br>AC = AC Power Port      DC = DC Power Port      N/E = Non-Electrical<br>I/O = Signal Input or Output Port<br>TP = Telecommunication Ports |       |                |                |         |

#### 4.6 Test Voltage and Frequency

| Case | Voltage (V) | Frequency (DC/AC-Hz) | Phases | Remarks |
|------|-------------|----------------------|--------|---------|
| 1    | AC 230      | 50                   | Single | None    |



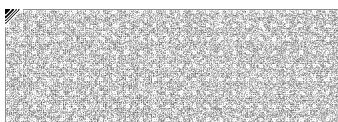
## 5. Test Summary

| Test Items                                | Applied Standards   | Results                 |
|---|---|-------------------------|
| <b>I. Emission</b>                        |   |                         |
| Conducted Disturbance                     | EN 55014-1 : 2017 + A11 : 2020<br>EN IEC 55014-1 : 2021<br>(CISPR 14-1 : 2020)  | <b>C</b>                |
| Disturbance Power                         | EN 55014-1 : 2017 + A11 : 2020<br>EN IEC 55014-1 : 2021<br>(CISPR 14-1 : 2020)  | <b>C</b>                |
| Discontinuous Disturbance                 | EN 55014-1 : 2017 + A11 : 2020<br>EN IEC 55014-1 : 2021<br>(CISPR 14-1 : 2020)  | <b>C</b>                |
| Magnetic Field Strength (9 kHz to 30 MHz) | EN 55014-1 : 2017 + A11 : 2020<br>EN IEC 55014-1 : 2021<br>(CISPR 14-1 : 2020)  | <b>N/A<br/>(Note 1)</b> |
| Radiated Disturbance                      | EN 55014-1 : 2017 + A11 : 2020<br>EN IEC 55014-1 : 2021<br>(CISPR 14-1 : 2020)  | <b>N/A<br/>(Note 2)</b> |
| Harmonic Current Emission                 | EN 61000-3-2 : 2014<br>EN IEC 61000-3-2 : 2019 + A1 : 2021<br>IEC 61000-3-2 : 2018 + A1 : 2020  | <b>C</b>                |
| Voltage Change, Fluctuations and Flicker  | EN 61000-3-3 : 2013<br>EN 61000-3-3 : 2013 + A1 : 2019 + A2 : 2021<br>IEC 61000-3-3 : 2013 + AMD1 : 2017 + AMD2 : 2021  | <b>C</b>                |
| <b>II. Immunity</b>                       |   |                         |
| Electrostatic Discharge                   | EN 55014-2 : 1997 + A1 : 2001 + A2 : 2008<br>EN 55014-2 : 1997 / AC : 1997<br>EN IEC 55014-2 : 2021<br>(CISPR 14-2 : 2020)<br>EN 61000-4-2 : 2009<br>(IEC 61000-4-2 : 2008)   | <b>C</b>                |
| Radio-Frequency Electromagnetic Field     | EN 55014-2 : 1997 + A1 : 2001 + A2 : 2008<br>EN 55014-2 : 1997 / AC : 1997<br>EN IEC 55014-2 : 2021<br>(CISPR 14-2 : 2020)<br>EN 61000-4-3 : 2006 + A1 : 2008 + A2 : 2010<br>(IEC 61000-4-3 : 2006 + A1 : 2007 + A2 : 2010) | <b>N/A<br/>(Note 3)</b> |
| Fast Transient                            | EN 55014-2 : 1997 + A1 : 2001 + A2 : 2008<br>EN 55014-2 : 1997 / AC : 1997<br>EN IEC 55014-2 : 2021<br>(CISPR 14-2 : 2020)<br>EN 61000-4-4 : 2012<br>(IEC 61000-4-4 : 2012)   | <b>C</b>                |
| Surges                                    | EN 55014-2 : 1997 + A1 : 2001 + A2 : 2008<br>EN 55014-2 : 1997 / AC : 1997<br>EN IEC 55014-2 : 2021<br>(CISPR 14-2 : 2020)<br>EN 61000-4-5 : 2014 + A1 : 2017<br>(IEC 61000-4-5 : 2014 + A1 : 2017)                         | <b>C</b>                |
| Radio-Frequency Continuous Conducted      | EN 55014-2 : 1997 + A1 : 2001 + A2 : 2008<br>EN 55014-2 : 1997 / AC : 1997<br>EN IEC 55014-2 : 2021<br>(CISPR 14-2 : 2020)<br>EN 61000-4-6 : 2014<br>(IEC 61000-4-6 : 2013)   | <b>C</b>                |

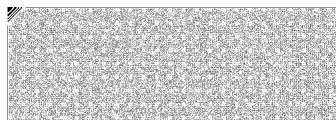


|   |  |   |
|---|--|---|
| Voltage Dips  | EN 55014-2 : 1997 + A1 : 2001 + A2 : 2008<br>EN 55014-2 : 1997 / AC : 1997<br>EN IEC 55014-2 : 2021<br>(CISPR 14-2 : 2020) | C |
|   | EN 61000-4-11 : 2004 / A1 : 2017<br>(IEC 61000-4-11 : 2020)  |   |
| C=Comply    N/C=Not Comply    N/T=Not Tested    N/A=Not Applicable  |  |   |
| <p>Note 1) Excluded from the Magnetic Field Strength (9 kHz to 30 MHz) test as there is no function for the above test in the EUT.</p> <p>Note 2) Replaced by Disturbance power test.</p> <p>Note 3) Excluded from the test because EUT applied Category 2.</p> |  |   |

**The data in this test report are traceable to the national or international standards.**

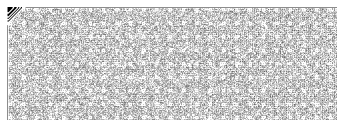
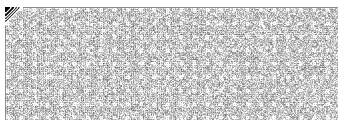


| Measurement Uncertainty                  |   |
|--|---|
| Test Items                               | $U(k=2)$  |
| <b>I. Emission</b>                       |   |
| Conducted Disturbance (9 kHz~ 30 MHz)    | Mains : 3.6 dB<br>Signal : 6.0 dB   |
| Conducted Disturbance (150 kHz ~ 30 MHz) | Mains : 3.4 dB<br>Signal : 6.0 dB   |
| Radiated Disturbance (3m)                | Below 1 GHz : 5.82 dB<br>Above 1 GHz : 7.2 dB   |
| Radiated Disturbance (10m)               | Below 1 GHz : 5.8 dB  |
| Disturbance Power                        | 3.3 dB  |
| Discontinuous Disturbance                | N/A   |
| Harmonic Current Emission                | 0.8 %   |
| Voltage Change, Fluctuations and Flicker | 3.6 %   |
| <b>II. Immunity</b>                      |   |
| Electrostatic Discharge                  | It has been demonstrated that the ESD generator meets the specified requirements in the standard with at least a 95% confidence       |
| Radiated RF EM Fields                    | 5.8 dB  |
| Fast Transient                           | It has been demonstrated that the EFT/Burst generator meets the specified requirements in the standard with at least a 95% confidence |
| Surges                                   | It has been demonstrated that the SURGE generator meets the specified requirements in the standard with at least a 95% confidence     |
| Radio-Frequency Continuous Conducted     | CDN : 1.3 dB<br>CLAMP : 4.56 dB   |
| Voltage Dips and Interruptions           | It has been demonstrated that the generator meets the specified requirements in the standard with at least a 95% confidence           |



## 6. Test Environment

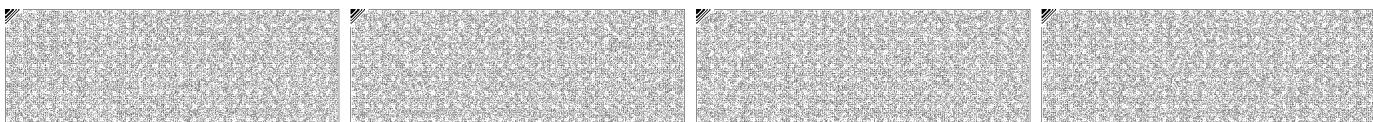
| Test Items                               | Test date<br>(YYYY-MM-DD) | Temp.<br>(°C) | Humidity<br>(% R.H.) | Pressure<br>(kPa) |
|--|---------------------------|---------------|----------------------|-------------------|
| <b>I. Emission</b>                       |                           |               |                      |                   |
| Conducted Disturbance                    | 2025-07-04                | 22            | 54                   | -                 |
| Disturbance Power                        | 2025-07-04                | 24            | 53                   |                   |
| Discontinuous Disturbance                | 2025-07-04                | 21            | 54                   |                   |
| Harmonic Current Emission                | 2025-07-07                | 21            | 53                   |                   |
| Voltage Change, Fluctuations and Flicker | 2025-07-07                | 21            | 53                   |                   |
| <b>II. Immunity</b>                      |                           |               |                      |                   |
| Electrostatic Discharge                  | 2025-07-08                | 21            | 53                   | 99.7              |
| Fast Transient                           | 2025-07-09                | 22            | 53                   | 100.1             |
| Surges                                   | 2025-07-09                | 22            | 53                   | 100.1             |
| Radio-Frequency Continuous Conducted     | 2025-07-08                | 21            | 53                   | 99.7              |
| Voltage Dips                             | 2025-07-09                | 22            | 53                   | 100.1             |



## 7. Emission

### 7.1 Terminal disturbance voltages (9 kHz to 30 MHz)

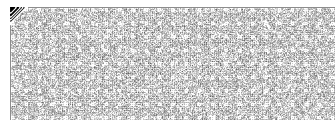
| EN IEC 55014-1<br>(CISPR 14-1)  | Terminal disturbance voltages                                    |                      |                                      |                      |                         | Result               |
|---|--|----------------------|--------------------------------------|----------------------|-------------------------|----------------------|
| <p><u>Method:</u> Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. All power was connected to the system through Line Impedance Stabilization Networks (LISN). Conducted voltage measurements on mains lines were made at the output of the LISN. Conducted voltage on load terminals and additional terminals were made by using a 1500 <math>\Omega</math> probe.</p> |  |                      |                                      |                      |                         | Comply               |
| Fully configured sample scanned over the following frequency range  |  |                      | Frequency range on each side of line |                      | Measurement Point       |                      |
|   |  |                      | 0.009 MHz to 30 MHz                  |                      | Mains                   |                      |
| EUT mode<br>(Refer to clauses 4)  |  |                      | Test configuration mode              |                      | 1                       |                      |
|   |  |                      | EUT Operation mode                   |                      | 1, 2                    |                      |
|   |  |                      | Power Interface mode                 |                      | 1                       |                      |
| Terminal voltage limits for the frequency range 9 kHz to 30 MHz   |  |                      |                                      |                      |                         |                      |
| General limits  |  |                      |                                      |                      |                         |                      |
| Frequency (MHz)   | Mains ports  |                      | Auxiliary ports                      |                      |                         |                      |
|   | Quasi-Peak (dB $\mu$ V)  | Average (dB $\mu$ V) | Quasi-Peak (dB $\mu$ V)              | Average (dB $\mu$ V) | Quasi-Peak (dB $\mu$ A) | Average (dB $\mu$ A) |
| 0.15 to 0.5   | 66 to 56   | 59 to 46             | 80                                   | 70                   | 40 to 30                | 30 to 20             |
| 0.5 to 5 (Note 2)   | 56   | 46                   | 74                                   | 64                   | 30                      | 20                   |
| 5 to 30   | 60   | 50                   | 74                                   | 64                   |                         |                      |
| Limits for the AC mains port of equipment with active IPT functions   |  |                      |                                      |                      |                         |                      |
| Frequency (MHz)   | Appliances which are 100 V rated and without an earth connection |                      | All other appliances                 |                      |                         |                      |
|   | Quasi-Peak (dB $\mu$ V)  | Average (dB $\mu$ V) | Quasi-Peak (dB $\mu$ V)              | Average (dB $\mu$ V) | Quasi-Peak (dB $\mu$ V) | Average (dB $\mu$ V) |
| 0.009 to 0.05   | 122  | -                    | 110                                  | -                    | -                       | -                    |
| 0.05 to 0.15 (Note 2)   | 102 to 92  | -                    | 90 to 80                             | -                    | -                       | -                    |
| 0.15 to 0.5 (Note 2)  | 72 to 62   | 62 to 52             | 66 to 56                             | 56 to 46             | -                       | -                    |
| 0.5 to 5  | 56   | 46                   | 56                                   | 46                   | -                       | -                    |
| 5 to 30   | 60   | 50                   | 60                                   | 50                   | -                       | -                    |
| Limits for the mains port of motor operated tools   |  |                      |                                      |                      |                         |                      |
| Frequency (MHz)   | $P \leq 700$ W   |                      | $700$ W < $P \leq 1000$ W            |                      | $P > 1000$ W            |                      |
|   | Quasi-Peak (dB $\mu$ V)  | Average (dB $\mu$ V) | Quasi-Peak (dB $\mu$ V)              | Average (dB $\mu$ V) | Quasi-Peak (dB $\mu$ V) | Average (dB $\mu$ V) |
| 0.15 to 0.35 (Note 3)   | 66 to 59   | 59 to 49             | 70 to 63                             | 63 to 53             | 76 to 69                | 69 to 59             |
| 0.35 to 5   | 59   | 49                   | 63                                   | 53                   | 69                      | 59                   |
| 5 to 30   | 64   | 54                   | 68                                   | 58                   | 74                      | 64                   |
| Note 1 The lower limit shall apply at the transition frequencies.   |  |                      |                                      |                      |                         |                      |
| Note 2 The limit decreases linearly with the logarithm of the frequency in the range 0.05 MHz to 0.5 MHz.   |  |                      |                                      |                      |                         |                      |
| Note 3 The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.35 MHz.  |  |                      |                                      |                      |                         |                      |



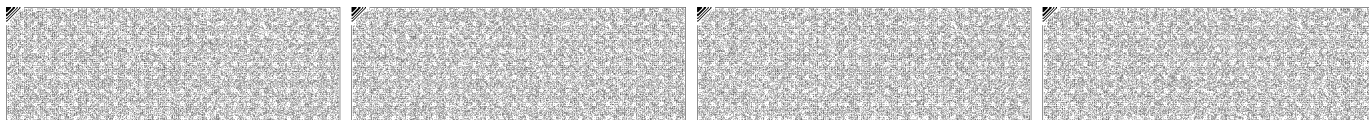
| Measurement Instrument |                      |               |            |            |            |
|------------------------|----------------------|---------------|------------|------------|------------|
| Description            | Model                | Manufacturer  | Identifier | Cal. Date  | Cal. Due   |
| MEASUREMENT SOFTWARE   | EMI-C VER. 2.00.0165 | TSJ           | N/A        | N/A        | N/A        |
| EMI TEST RECEIVER      | ESR                  | ROHDE&SCHWARZ | 101767     | 2024-11-29 | 2025-11-28 |
| LISN                   | NNLK 8129 RC         | SCHWARZBECK   | 05234      | 2025-04-01 | 2026-03-31 |
| PULSE LIMITER          | ESH3-Z2              | ROHDE&SCHWARZ | 103336     | 2025-01-13 | 2026-01-12 |

#### Calculation

|  |
|--|
| N : Neutral phase, L1 : Live phase   |
| C.FACTOR(dB) : Pulse Limiter(dB) + Cable loss(dB) + Insertion loss of LISN(dB) |
| Result(dB $\mu$ V) : Reading Value(dB $\mu$ V) + C.FACTOR(dB)                  |
| Margin(dB) : Limit(dB $\mu$ V) - Result(dB $\mu$ V)                            |

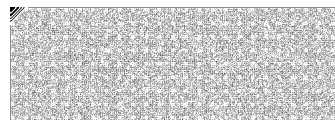
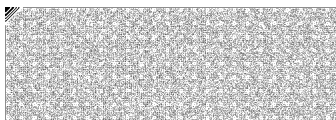


| Mains terminal disturbance voltage _ Test setup photo                                |   |                    |      |
|--|---|--------------------|------|
| Test configuration mode  | 1 | EUT Operation mode | 1, 2 |
|   |   |                    |      |
|  |   |                    |      |



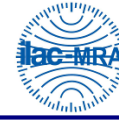
| Auxiliary terminal disturbance voltage _ Test setup photo |     |                    |     |
|---|-----|--------------------|-----|
| Test configuration mode                                   | N/A | EUT Operation mode | N/A |
| N/A   |     |                    |     |

| Auxiliary terminal disturbance voltage _ Measurement data |     |                      |     |
|---|-----|----------------------|-----|
| Test configuration mode                                   | N/A | EUT Operation mode   | N/A |
| Test voltage (V)  | N/A | Frequency (DC/AC-Hz) | N/A |





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| Mains terminal disturbance voltage _ Measurement data |        |                      |    |
|---|--------|----------------------|----|
| Test configuration mode                               | 1      | EUT Operation mode   | 1  |
| Test voltage (V)                                      | AC 230 | Frequency (DC/AC-Hz) | 50 |

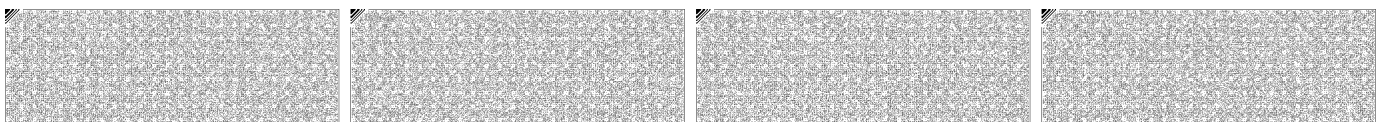
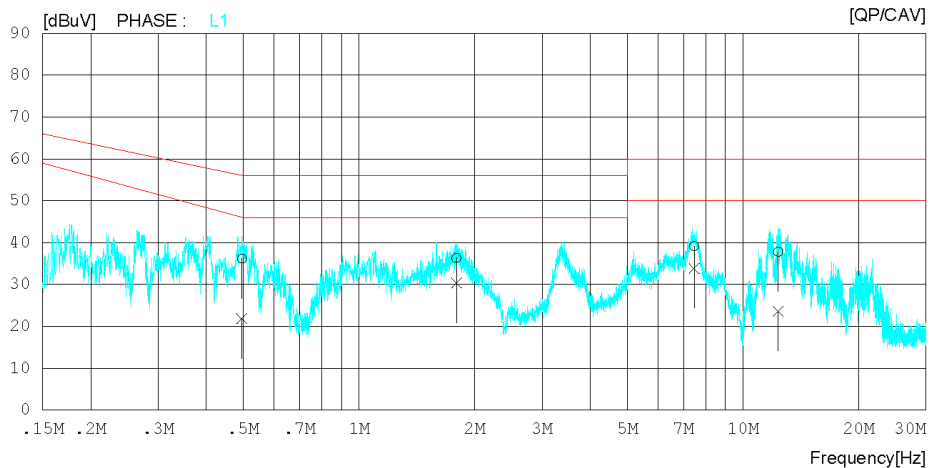
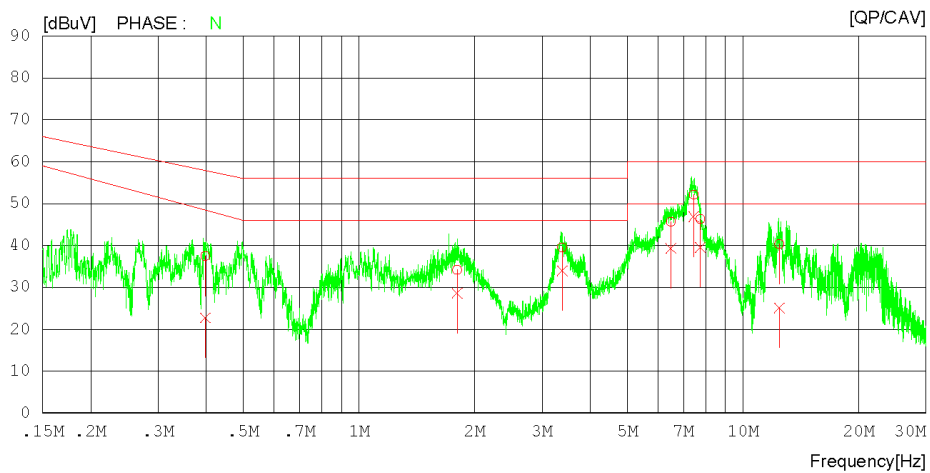
Date 2025-07-04

Order No. DTNC2507-05081  
 Power Supply AC 230 V 50 Hz  
 Temp/Humi. 22 °C 54 % R.H.  
 Test Condition HIGH

Memo

LIMIT : CISPR14-1 AV(Mains)  
 CISPR14-1 QP(Mains)

Lisn Factor  
 1. EMC-654\_NNLK 8129 RC\_05234\_N\_2025.04.01  
 2. EMC-654\_NNLK 8129 RC\_05234\_L1\_2025.04.01  
 Cable Loss  
 1. CE(11)\_FCE01\_9k~30M\_20241010  
 Pulse Limiter  
 1. PULSE LIMITER\_ESH3-Z2\_103336\_20250113





Report No.: DREKCEE2507-0230



Date 2025-07-04

Order No. DTNC2507-05081  
 Power Supply AC 230 V 50 Hz  
 Temp/Humi. 22 °C 54 % R.H.  
 Test Condition HIGH

Memo

LIMIT : CISPR14-1 AV(Mains)  
 CISPR14-1 QP(Mains)

Lisn Factor

- EMC-654\_NNLK 8129 RC\_05234\_N\_2025.04.01
- EMC-654\_NNLK 8129 RC\_05234\_L1\_2025.04.01

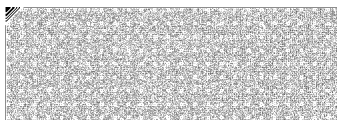
Cable Loss

- CE(11)\_FCE01\_9k-30M\_20241010

Pulse Limiter

- PULSE LIMITER\_ESH3-Z2\_103336\_20250113

| NO | FREQ<br>[MHz] | READING      |               | C. FACTOR<br>[dB] | RESULT       |               | LIMIT        |               | MARGIN       |               | PHASE |
|----|---------------|--------------|---------------|-------------------|--------------|---------------|--------------|---------------|--------------|---------------|-------|
|    |               | QP<br>[dBuV] | CAV<br>[dBuV] |                   | QP<br>[dBuV] | CAV<br>[dBuV] | QP<br>[dBuV] | CAV<br>[dBuV] | QP<br>[dBuV] | CAV<br>[dBuV] |       |
| 1  | 0.39742       | 27.36        | 12.62         | 10.08             | 37.44        | 22.70         | 57.91        | 48.48         | 20.47        | 25.78         | N     |
| 2  | 1.80148       | 24.02        | 18.35         | 10.18             | 34.20        | 28.53         | 56.00        | 46.00         | 21.80        | 17.47         | N     |
| 3  | 3.38184       | 29.24        | 23.69         | 10.25             | 39.49        | 33.94         | 56.00        | 46.00         | 16.51        | 12.06         | N     |
| 4  | 6.48848       | 35.28        | 28.94         | 10.38             | 45.66        | 39.32         | 60.00        | 50.00         | 14.34        | 10.68         | N     |
| 5  | 7.44196       | 41.74        | 36.43         | 10.41             | 52.15        | 46.84         | 60.00        | 50.00         | 7.85         | 3.16          | N     |
| 6  | 7.75060       | 35.83        | 29.15         | 10.42             | 46.25        | 39.57         | 60.00        | 50.00         | 13.75        | 10.43         | N     |
| 7  | 12.43460      | 29.76        | 14.56         | 10.53             | 40.29        | 25.09         | 60.00        | 50.00         | 19.71        | 24.91         | N     |
| 8  | 0.49566       | 26.07        | 11.77         | 10.11             | 36.18        | 21.88         | 56.07        | 46.09         | 19.89        | 24.21         | L1    |
| 9  | 1.79484       | 26.14        | 20.19         | 10.18             | 36.32        | 30.37         | 56.00        | 46.00         | 19.68        | 15.63         | L1    |
| 10 | 7.46280       | 28.81        | 23.54         | 10.39             | 39.20        | 33.93         | 60.00        | 50.00         | 20.80        | 16.07         | L1    |
| 11 | 12.36624      | 27.34        | 13.17         | 10.48             | 37.82        | 23.65         | 60.00        | 50.00         | 22.18        | 26.35         | L1    |





Report No.: DREKCEE2507-0230



| Mains terminal disturbance voltage _ Measurement data |        |                      |    |
|---|--------|----------------------|----|
| Test configuration mode                               | 1      | EUT Operation mode   | 2  |
| Test voltage (V)                                      | AC 230 | Frequency (DC/AC-Hz) | 50 |

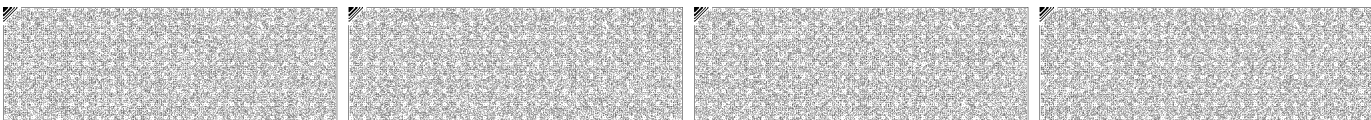
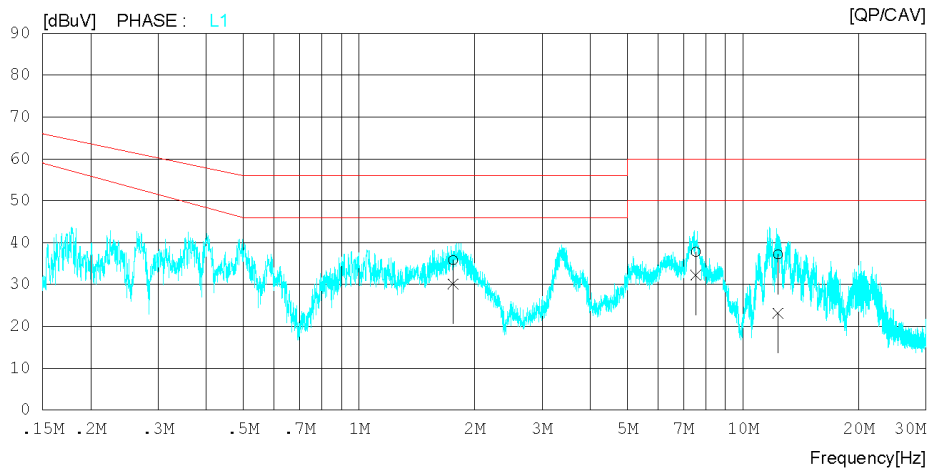
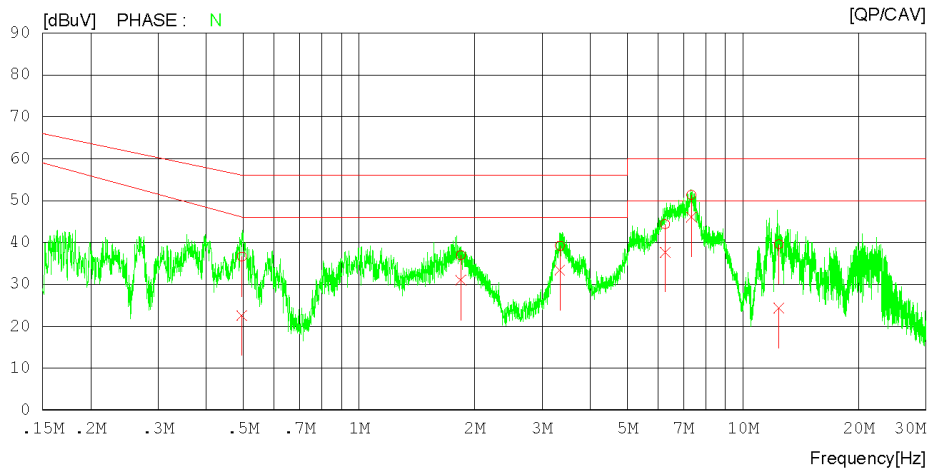
Date 2025-07-04

Order No. DTNC2507-05081  
 Power Supply AC 230 V 50 Hz  
 Temp/Humi. 22 °C 54 % R.H.  
 Test Condition MIDDLE

Memo

LIMIT : CISPR14-1 AV(Mains)  
 CISPR14-1 QP(Mains)

Lisn Factor  
 1. EMC-654\_NNLK 8129 RC\_05234\_N\_2025.04.01  
 2. EMC-654\_NNLK 8129 RC\_05234\_L1\_2025.04.01  
 Cable Loss  
 1. CE(11)\_FCE01\_9k~30M\_20241010  
 Pulse Limiter  
 1. PULSE LIMITER\_ESH3-Z2\_103336\_20250113





Report No.: DREKCEE2507-0230



Date 2025-07-04

Order No. DTNC2507-05081  
 Power Supply AC 230 V 50 Hz  
 Temp/Humi. 22 °C 54 % R.H.  
 Test Condition MIDDLE

Memo

LIMIT : CISPR14-1 AV(Mains)  
 CISPR14-1 QP(Mains)

Lisn Factor

- EMC-654\_NNLK 8129 RC\_05234\_N\_2025.04.01
- EMC-654\_NNLK 8129 RC\_05234\_L1\_2025.04.01

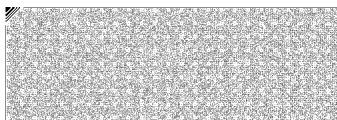
Cable Loss

- CE(11)\_FCE01\_9k-30M\_20241010

Pulse Limiter

- PULSE LIMITER\_ESH3-Z2\_103336\_20250113

| NO | FREQ<br>[MHz] | READING      |               | C. FACTOR<br>[dB] | RESULT       |               | LIMIT        |               | MARGIN       |               | PHASE |
|----|---------------|--------------|---------------|-------------------|--------------|---------------|--------------|---------------|--------------|---------------|-------|
|    |               | QP<br>[dBuV] | CAV<br>[dBuV] |                   | QP<br>[dBuV] | CAV<br>[dBuV] | QP<br>[dBuV] | CAV<br>[dBuV] | QP<br>[dBuV] | CAV<br>[dBuV] |       |
| 1  | 0.49568       | 26.50        | 12.42         | 10.12             | 36.62        | 22.54         | 56.07        | 46.09         | 19.45        | 23.55         | N     |
| 2  | 1.84260       | 26.79        | 20.79         | 10.19             | 36.98        | 30.98         | 56.00        | 46.00         | 19.02        | 15.02         | N     |
| 3  | 3.33520       | 28.91        | 23.08         | 10.25             | 39.16        | 33.33         | 56.00        | 46.00         | 16.84        | 12.67         | N     |
| 4  | 6.27840       | 33.98        | 27.28         | 10.38             | 44.36        | 37.66         | 60.00        | 50.00         | 15.64        | 12.34         | N     |
| 5  | 7.34116       | 40.94        | 35.67         | 10.41             | 51.35        | 46.08         | 60.00        | 50.00         | 8.65         | 3.92          | N     |
| 6  | 12.39500      | 29.02        | 13.79         | 10.53             | 39.55        | 24.32         | 60.00        | 50.00         | 20.45        | 25.68         | N     |
| 7  | 1.75756       | 25.64        | 19.98         | 10.18             | 35.82        | 30.16         | 56.00        | 46.00         | 20.18        | 15.84         | L1    |
| 8  | 7.54564       | 27.44        | 21.90         | 10.39             | 37.83        | 32.29         | 60.00        | 50.00         | 22.17        | 17.71         | L1    |
| 9  | 12.34100      | 26.70        | 12.69         | 10.48             | 37.18        | 23.17         | 60.00        | 50.00         | 22.82        | 26.83         | L1    |



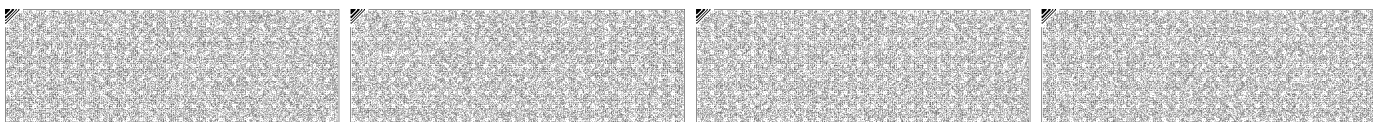
## 7.2 Magnetic Field induced current (9 kHz to 30 MHz)

| EN IEC 55014-1<br>(CISPR 14-1)  | Magnetic field induced current       | Result                  |
|---|--------------------------------------|-------------------------|
| <p><b>Method:</b> The EUT placed on a wood table in the center of a loop antenna (Diameter is 2 m). The Induced current in the loop antenna is measured by means of a current probe and the test receiver. Three field components are checked by means of a coaxial switch. The frequency range from 9 kHz to 30 MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9 kHz to 150 kHz, the bandwidth of the field strength meter is set at 200 Hz. For frequency band 150 kHz to 30 MHz, the bandwidth is set at 9 kHz. For further description of the configuration refer to the picture of the test set-up</p> |                                      | <b>Not Applicable</b>   |
| Fully configured sample scanned over the following frequency range  | Frequency range on each side of line | Measurement Point       |
|   | 0.009 MHz to 30 MHz                  | Mains                   |
|   | EUT mode (Refer to clauses 4)        | N/A                     |
|   | Test configuration mode              | N/A                     |
|   | EUT Operation mode                   | N/A                     |
|   | Power Interface mode                 | N/A                     |
| Magnetic field induced current limits for the frequency range 9 kHz to 30 MHz   |                                      |                         |
| Equipment using IPT   |                                      |                         |
| Frequency (MHz)   | Horizontal component                 | Vertical component      |
|   | Quasi-Peak (dB $\mu$ A)              | Quasi-Peak (dB $\mu$ A) |
| 0.009 to 0.07   | 88                                   | 106                     |
| 0.07 to 0.15  | 88 to 58                             | 106 to 76               |
| 0.15 to 30  | 58 to 22                             | 76 to 40                |
| Note 1 The lower limit shall apply at the transition frequencies.   |                                      |                         |
| Note 2 The limit decreases linearly with the logarithm of the frequency in the range 0.07 MHz to 30 MHz.  |                                      |                         |

| Measurement Instrument |       |              |            |           |          |
|------------------------|-------|--------------|------------|-----------|----------|
| Description            | Model | Manufacturer | Identifier | Cal. Date | Cal. Due |
| -                      | -     | -            | -          | -         | -        |

## Calculation

|  |
|--|
| N : Neutral phase, L1 : Live phase   |
| C.FACTOR(dB) : Pulse Limiter(dB) + Cable loss(dB) + Insertion loss of LISN(dB) |
| Result(dB $\mu$ V) : Reading Value(dB $\mu$ V) + C.FACTOR(dB)                  |
| Margin(dB) : Limit(dB $\mu$ V) - Result(dB $\mu$ V)                            |



| Magnetic field induced current _ Test setup photo |     |                    |     |
|---|-----|--------------------|-----|
| Test configuration mode                           | N/A | EUT Operation mode | N/A |
| N/A   |     |                    |     |

| Magnetic field induced current _ Measurement data _ X axis |     |                      |     |
|--|-----|----------------------|-----|
| Test configuration mode                                    | N/A | EUT Operation mode   | N/A |
| Test voltage (V)   | N/A | Frequency (DC/AC-Hz) | N/A |

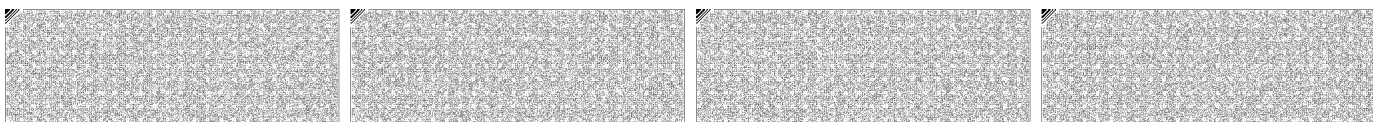
| Magnetic field induced current _ Measurement data _ Y axis |     |                      |     |
|--|-----|----------------------|-----|
| Test configuration mode                                    | N/A | EUT Operation mode   | N/A |
| Test voltage (V)   | N/A | Frequency (DC/AC-Hz) | N/A |

| Magnetic field induced current _ Measurement data _ Z axis |     |                      |     |
|--|-----|----------------------|-----|
| Test configuration mode                                    | N/A | EUT Operation mode   | N/A |
| Test voltage (V)   | N/A | Frequency (DC/AC-Hz) | N/A |



## 7.3 Disturbance power - 30 MHz to 300 MHz

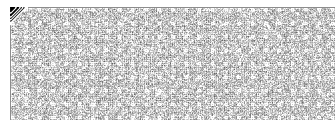
| EN IEC 55014-1<br>(CISPR 14-1)   |                       | Disturbance power   |                               |                       |   |                       |                               |                       | Result                        |
|--|-----------------------|---|-------------------------------|-----------------------|---|-----------------------|-------------------------------|-----------------------|-------------------------------|
|  |                       | <p><b>Method:</b> Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. All power was connected to the system through Line Impedance Stabilization Networks (LISN). The lead to be measured on is stretched in a straight line for a distance sufficient to accommodate the absorbing clamp, and to permit the necessary measuring adjustment of position for tuning. The clamp is placed around the lead so as to measure a quantity proportional to the disturbance on the lead.</p> |                               |                       |   |                       |                               |                       | <b>Comply</b>                 |
| Fully configured sample scanned over the following frequency range   |                       | Frequency range on each side of line  |                               |                       |   | Measurement Point     |                               |                       |                               |
|  |                       | 30 MHz to 300 MHz   |                               |                       |   | Mains                 |                               |                       |                               |
| EUT mode<br>(Refer to clauses 4)   |                       | Test configuration mode   |                               |                       |   | 1                     |                               |                       |                               |
|  |                       | EUT Operation mode  |                               |                       |   | 1, 2                  |                               |                       |                               |
|  |                       | Power Interface mode  |                               |                       |   | 1                     |                               |                       |                               |
| <b>Disturbance power limits for the frequency range 30 MHz to 300 MHz</b>  |                       |   |                               |                       |   |                       |                               |                       |                               |
| Frequency<br>(MHz)   | General               |   | Tools                         |                       |   |                       |                               |                       |                               |
|  | Quasi-Peak<br>dB (pW) | Average<br>dB (pW)<br>(Note1)   | $P \leq 700 \text{ W}$        |                       | $700 \text{ W} < P \leq 1\,000 \text{ W}$ |                       | $P > 1\,000 \text{ W}$        |                       |                               |
| Quasi-Peak<br>dB (pW)  |                       |   | Average<br>dB (pW)<br>(Note1) | Quasi-Peak<br>dB (pW) | Average<br>dB (pW)<br>(Note1)             | Quasi-Peak<br>dB (pW) | Average<br>dB (pW)<br>(Note1) | Quasi-Peak<br>dB (pW) | Average<br>dB (pW)<br>(Note1) |
| 30 to 300  | 45 to 55              | 35 to 45  | 45 to 55                      | 35 to 45              | 49 to 59                                  | 39 to 49              | 55 to 65                      | 45 to 55              |                               |
| <p>Note 1 If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.</p> <p>Note 2 The limit decreases linearly with the logarithm of the frequency in the range 30 MHz to 300 MHz.</p> |                       |   |                               |                       |   |                       |                               |                       |                               |
| <b>Margin when performing disturbance power measurement in the frequency range 30 MHz to 300 MHz</b>   |                       |   |                               |                       |   |                       |                               |                       |                               |
| Frequency<br>(MHz)   | General               |   | Tools                         |                       |   |                       |                               |                       |                               |
|  | Quasi-Peak<br>dB (pW) | Average<br>dB (pW)  | $P \leq 700 \text{ W}$        |                       | $700 \text{ W} < P \leq 1\,000 \text{ W}$ |                       | $P > 1\,000 \text{ W}$        |                       |                               |
| Quasi-Peak<br>dB (pW)  |                       |   | Average<br>dB (pW)            | Quasi-Peak<br>dB (pW) | Average<br>dB (pW)                        | Quasi-Peak<br>dB (pW) | Average<br>dB (pW)            | Quasi-Peak<br>dB (pW) | Average<br>dB (pW)            |
| 200 to 300   | 0 to 10 dB            | -   | 0 to 10 dB                    | -                     | 0 to 10 dB                                | -                     | 0 to 10 dB                    | -                     |                               |
| <p>Note 1 This table only applies if specified in 4.1.2.3.2.</p> <p>Note 2 The measured result at a particular frequency shall be less than the relevant limit minus the corresponding margin (at that frequency).</p>   |                       |   |                               |                       |   |                       |                               |                       |                               |




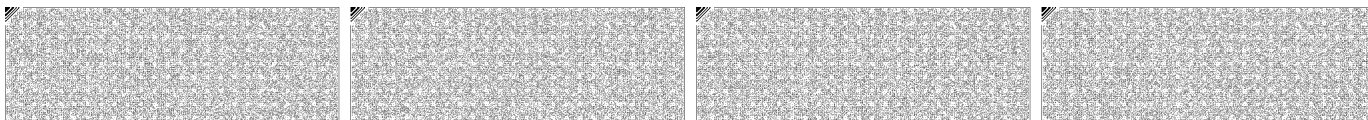
| Measurement Instrument        |           |               |            |            |            |
|-------------------------------|-----------|---------------|------------|------------|------------|
| Description                   | Model     | Manufacturer  | Identifier | Cal. Date  | Cal. Due   |
| EMI TEST RECEIVER             | ESR       | ROHDE&SCHWARZ | 101767     | 2024-11-29 | 2025-11-28 |
| ABSORBING CLAMP               | MDS21     | LUTHI         | 3664       | 2025-06-25 | 2026-06-24 |
| ATTENUATOR                    | CFA-03    | TME           | N/A        | 2025-06-25 | 2026-06-24 |
| COMMON MODE ABSORPTION DEVICE | CMAD 1614 | SCHWARZBECK   | 1614-128   | 2025-03-14 | 2026-03-13 |

### Calculation

|   |
|---|
| C.FACTOR(dB) : Attenuator(dB) + Cable loss(dB) + Insertion loss of ABSORBING CLAMP (dB) |
| Result(dB $\mu$ V) : Reading Value(dB $\mu$ W) + C.FACTOR(dB)                           |
| Margin(dB) : Limit(dB $\mu$ W) - Result(dB $\mu$ W)                                     |



| Disturbance power _ Test setup photo  |   |                    |      |
|---|---|--------------------|------|
| Test configuration mode   | 1 | EUT Operation mode | 1, 2 |
|  |   |                    |      |





Report No.: DREKCEE2507-0230



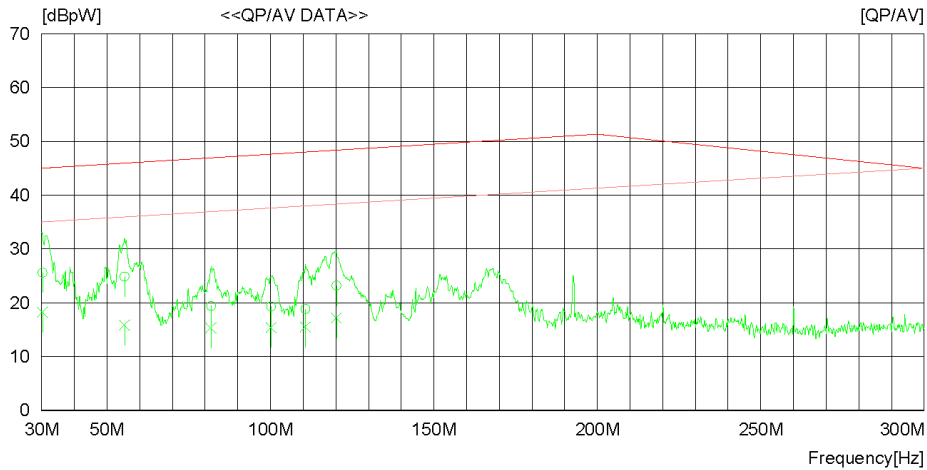
| Disturbance power _ Measurement data |        |                      |    |
|--------------------------------------|--------|----------------------|----|
| Test configuration mode              | 1      | EUT Operation mode   | 1  |
| Test voltage (V)                     | AC 230 | Frequency (DC/AC-Hz) | 50 |

Date : 2025-07-04

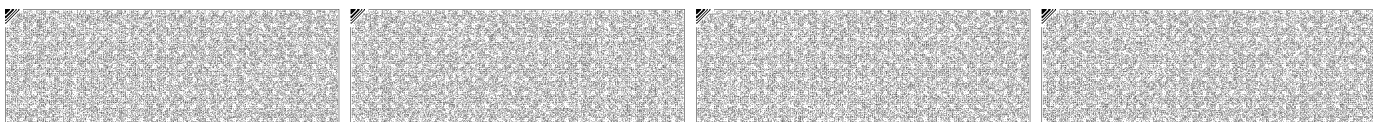
Order No. : DTNC2507-05081  
 Power Supply : AC 230 V 50 Hz  
 Temp/Humi. : 24 °C 53 % R.H.  
 Test Condition : HIGH

Memo :

LIMIT : QP  
 AV

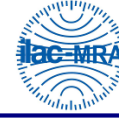


| No. | FREQ<br>[MHz] | READING      |              | C. FAC<br>[dB] | RESULT       |              | LIMIT        |              | MARGIN       |              | CLAMP<br>[cm] |
|-----|---------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
|     |               | QP<br>[dBuV] | AV<br>[dBuV] |                | QP<br>[dBpW] | AV<br>[dBpW] | QP<br>[dBpW] | AV<br>[dBpW] | QP<br>[dBpW] | AV<br>[dBpW] |               |
| 1   | 30.270        | 15.6         | 8.2          | 10.0           | 25.6         | 18.2         | 45.0         | 35.0         | 19.4         | 16.8         | 121           |
| 2   | 55.380        | 16.8         | 7.8          | 8.1            | 24.9         | 15.9         | 45.9         | 35.9         | 21.0         | 20.0         | 34            |
| 3   | 81.840        | 11.4         | 7.3          | 8.0            | 19.4         | 15.3         | 46.9         | 36.9         | 27.5         | 21.6         | 78            |
| 4   | 100.200       | 11.7         | 7.8          | 7.6            | 19.3         | 15.4         | 47.6         | 37.6         | 28.3         | 22.2         | 95            |
| 5   | 110.730       | 10.4         | 7.1          | 8.4            | 18.8         | 15.5         | 48.0         | 38.0         | 29.2         | 22.5         | 31            |
| 6   | 120.179       | 15.0         | 9.0          | 8.2            | 23.2         | 17.2         | 48.3         | 38.3         | 25.1         | 21.1         | 20            |





Report No.: DREKCEE2507-0230



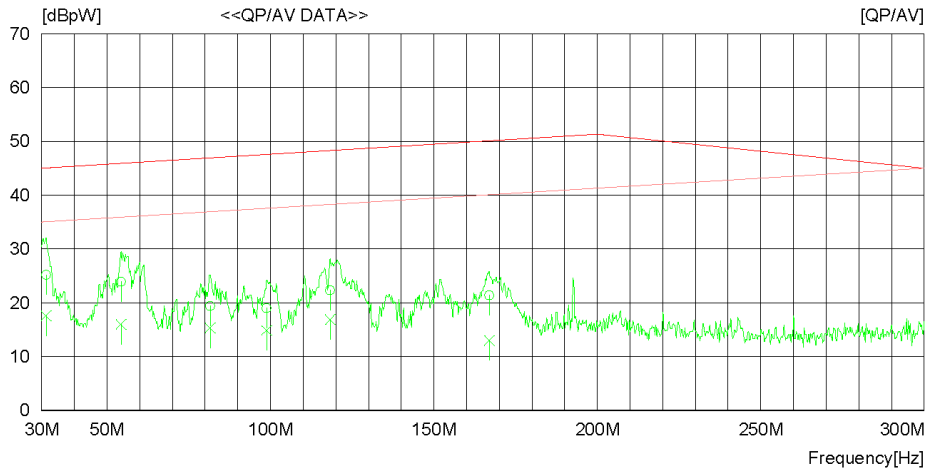
| Disturbance power _ Measurement data |        |                      |    |
|--------------------------------------|--------|----------------------|----|
| Test configuration mode              | 1      | EUT Operation mode   | 1  |
| Test voltage (V)                     | AC 230 | Frequency (DC/AC-Hz) | 50 |

Date : 2025-07-04

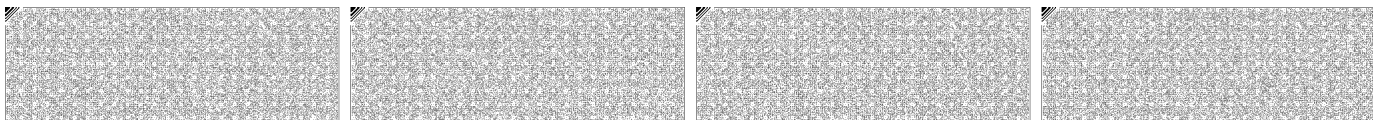
Order No. : DTNC2507-05081  
 Power Supply : AC 230 V 50 Hz  
 Temp/Humi. : 24 °C 53 % R.H.  
 Test Condition : MIDDLE

Memo :

LIMIT : QP  
 AV



| No. | FREQ<br>[MHz] | READING      |              | C. FAC<br>[dB] | RESULT       |              | LIMIT        |              | MARGIN       |              | CLAMP<br>[cm] |
|-----|---------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
|     |               | QP<br>[dBuV] | AV<br>[dBuV] |                | QP<br>[dBpW] | AV<br>[dBpW] | QP<br>[dBpW] | AV<br>[dBpW] | QP<br>[dBpW] | AV<br>[dBpW] |               |
| 1   | 31.350        | 15.3         | 7.7          | 9.9            | 25.2         | 17.6         | 45.1         | 35.1         | 19.9         | 17.5         | 54            |
| 2   | 54.300        | 15.8         | 7.9          | 8.1            | 23.9         | 16.0         | 45.9         | 35.9         | 22.0         | 19.9         | 39            |
| 3   | 81.570        | 11.4         | 7.3          | 8.0            | 19.4         | 15.3         | 46.9         | 36.9         | 27.5         | 21.6         | 102           |
| 4   | 98.850        | 11.5         | 7.4          | 7.5            | 19.0         | 14.9         | 47.6         | 37.6         | 28.6         | 22.7         | 36            |
| 5   | 118.289       | 14.0         | 8.6          | 8.3            | 22.3         | 16.9         | 48.3         | 38.3         | 26.0         | 21.4         | 77            |
| 6   | 166.890       | 13.8         | 5.4          | 7.6            | 21.4         | 13.0         | 50.1         | 40.1         | 28.7         | 27.1         | 112           |



## 7.4 Discontinuous Disturbance

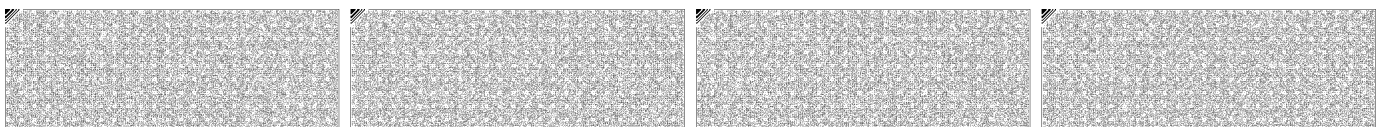
| EN IEC 55014-1<br>(CISPR 14-1)   | Discontinuous Disturbance            |       |       |                   | Result        |
|--|--------------------------------------|-------|-------|-------------------|---------------|
| <b>Method:</b> Measurement of a disturbance, the amplitude of which exceeds the quasi-peak limit of continuous disturbance, the duration of which is not longer than 200 ms which is separated from a subsequent disturbance by at least 200 ms.   |                                      |       |       |                   | <b>Comply</b> |
| Fully configured sample scanned<br>over the following frequency range  | Frequency range on each side of line |       |       | Measurement Point |               |
|  | 0,15 MHz, 0,5 MHz, 1.4 MHz, 30 MHz   |       |       | Mains             |               |
| EUT mode<br>(Refer to clauses 4)   | Test configuration mode              |       |       | 1                 |               |
|  | EUT Operation mode                   |       |       | 1, 2              |               |
|  | Power Interface mode                 |       |       | 1                 |               |
| The test include Run A and Run B. The first one is to detect the Click rate and Run B is to detect how many clicks overlap the limits that are calculated according the formula below;<br>The sensitivity = Run A + 20 * log (30/Click rate) for $0.2 \leq N < 30$ ,<br>The Sensitivity = Run A + 44 for $N < 0.2$ , |                                      |       |       |                   |               |
| <b>- First test run A</b>  |                                      |       |       |                   |               |
| Frequency range (MHz)  | 0.15                                 | 0.50  | 1.40  | 30.00             |               |
| Permitted limit for<br>Continuous interference (dB $\mu$ V)  | 66                                   | 56    | 56    | 60                |               |
| The appliance was deemed to comply with the limits if fulfilling the three conditions below:<br>: the click rate is not more than 5.<br>: none of the caused clicks has a duration longer than 20 ms.<br>: 90 % of the caused clicks have a duration less than 10 ms.  |                                      |       |       |                   |               |
| <b>- Second test run B</b>   |                                      |       |       |                   |               |
| Frequency range (MHz)  | 0.15                                 | 0.50  | 1.40  | 30.00             |               |
| Permitted limit<br>for clicks (dB $\mu$ V)   | $L_q$                                | $L_q$ | $L_q$ | $L_q$             |               |
| $\Delta L = 44 \text{ dB}$ for $N < 0,2$<br>$\Delta L = [20 \log (30/M)] \text{ dB}$ for $0,2 \leq N < 30$   |                                      |       |       |                   |               |
| The click limit $L_q$ is determined from the formula :<br>$L_q = L + \Delta L$   |                                      |       |       |                   |               |

| Measurement Instrument                     |   |                 |             |            |            |
|--|---|-----------------|-------------|------------|------------|
| Description                                | Model   | Manufacturer    | Identifier  | Cal. Date  | Cal. Due   |
| MEASUREMENT SOFTWARE                       | CLICK METER SOFTWARE CMS FOR DDA55 Version 3.07 | AFJ             | N/A         | N/A        | N/A        |
| DIGITAL DISCONTINUOUS DISTURBANCE ANALYZER | DDA55   | AFJ INSTRUMENTS | 14041744118 | 2025-04-07 | 2026-04-06 |
| SWITCHING OPERATION BOX                    | SW04/100A                                       | AFJ INSTRUMENTS | SW041748133 | N/A        | N/A        |
| LISN                                       | NNLK 8129 RC                                    | SCHWARZBECK     | 05234       | 2025-04-01 | 2026-03-31 |



**Discontinuous Disturbance \_ Test setup photo**

|                                |          |                           |             |
|--------------------------------|----------|---------------------------|-------------|
| <b>Test configuration mode</b> | <b>1</b> | <b>EUT Operation mode</b> | <b>1, 2</b> |
|--------------------------------|----------|---------------------------|-------------|



| Discontinuous Disturbance at 0.15, 0.5, 1.4, 30 MHz _ Measurement data |        |                      |    |
|--|--------|----------------------|----|
| Test configuration mode  | 1      | EUT Operation mode   | 1  |
| Test voltage (V)   | AC 230 | Frequency (DC/AC-Hz) | 50 |



## TEST REPORT

TEST PASS

4/7/2025 17:28:15

Title **DTNC2507-05081** Time Test **02:00:00.00**  
 Required **AC 230 V 50 Hz** Executed by **Kwon Uk Hyeon**  
 Description **21 °C 54 % R.H.**  
 Model **HSE-T21400KF**  
 Type **SN**  
 Report **HIGH**

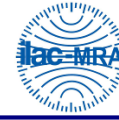
Mode **Click Measurements**Type of Eut **Fans**

|                              |                           |                              |             |
|------------------------------|---------------------------|------------------------------|-------------|
| Rx 150 kHz Att. [dB]         | <b>20</b>                 | Rx 500 kHz Att. [dB]         | <b>20</b>   |
| Rx 1.4 MHz Att. [dB]         | <b>20</b>                 | Rx 30 MHz Att. [dB]          | <b>20</b>   |
| Rx 150 kHz Input Offset [dB] | <b>0.11</b>               | Rx 500 kHz Input Offset [dB] | <b>0.12</b> |
| Rx 1.4 MHz Input Offset [dB] | <b>0.14</b>               | Rx 30 MHz Input Offset [dB]  | <b>0.39</b> |
| External Att. [dB]           | <b>NONE</b>               |                              |             |
| Remote                       | <b>SW04/100 - NEUTRAL</b> |                              |             |





Report No.: DREKCEE2507-0230



|                     | 150 kHz     | 500 kHz     | 1.4 MHz     | 30 MHz      |
|---------------------|-------------|-------------|-------------|-------------|
| <b>First Run</b>    |             |             |             |             |
| Limit [dBuV]        | 66          | 56          | 56          | 60          |
| Dynamic Thr [dB]    | 0           | 0           | 0           | 0           |
| Short               | 0           | 0           | 0           | 0           |
| Long                | 0           | 0           | 0           | 0           |
| Long (10< t ≤20 ms) | 0           | 0           | 0           | 0           |
| Tot. Clicks Corr    | 0           | 0           | 0           | 0           |
| Events              | 0           | 0           | 0           | 0           |
| Time(s)             | 0.00        | 0.00        | 0.00        | 0.00        |
| Sw.Op.              | 0           | 0           | 0           | 0           |
| 5.4.3.5 events      | 0           | 0           | 0           | 0           |
| N                   | 0.00        | 0.00        | 0.00        | 0.00        |
|                     | <b>PASS</b> | <b>PASS</b> | <b>PASS</b> | <b>PASS</b> |

|         |           |         |           |
|---------|-----------|---------|-----------|
| 150 kHz | No Clicks | 500 kHz | No Clicks |
| 1.4 MHz | No Clicks | 30 MHz  | No Clicks |

New Limit [dBuV]

Allowed Clicks

Dynamic Thr [dB]

SECOND PASS NOT ALLOWED

Short

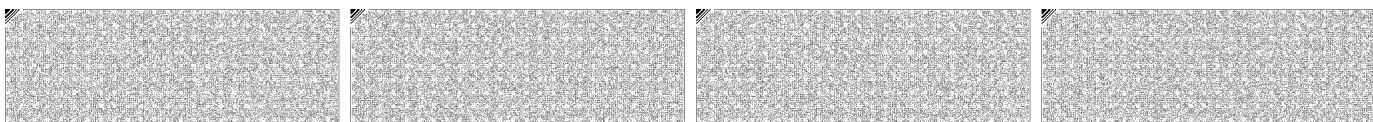
Long

Tot. Clicks Corr

Events

Time(s)

5.4.3.5 events



| Discontinuous Disturbance at 0.15, 0.5, 1.4, 30 MHz _ Measurement data |        |                      |    |
|--|--------|----------------------|----|
| Test configuration mode  | 1      | EUT Operation mode   | 2  |
| Test voltage (V)   | AC 230 | Frequency (DC/AC-Hz) | 50 |



## TEST REPORT

TEST PASS

4/7/2025 15:22:13

Title **DTNC2507-05081** Time Test **02:00:00.00**  
 Required **AC 230 V 50 Hz** Executed by **Kwon Uk Hyeon**  
 Description **21 °C 54 % R.H.**  
 Model **HSE-T21400KF**  
 Type **SN**  
 Report **MIDDLE**

Mode **Click Measurements**Type of Eut **Fans**

|                              |                           |                              |             |
|------------------------------|---------------------------|------------------------------|-------------|
| Rx 150 kHz Att. [dB]         | <b>20</b>                 | Rx 500 kHz Att. [dB]         | <b>20</b>   |
| Rx 1.4 MHz Att. [dB]         | <b>20</b>                 | Rx 30 MHz Att. [dB]          | <b>20</b>   |
| Rx 150 kHz Input Offset [dB] | <b>0.11</b>               | Rx 500 kHz Input Offset [dB] | <b>0.12</b> |
| Rx 1.4 MHz Input Offset [dB] | <b>0.14</b>               | Rx 30 MHz Input Offset [dB]  | <b>0.39</b> |
| External Att. [dB]           | <b>NONE</b>               |                              |             |
| Remote                       | <b>SW04/100 - NEUTRAL</b> |                              |             |





Report No.: DREKCEE2507-0230



|                     | 150 kHz     | 500 kHz     | 1.4 MHz     | 30 MHz      |
|---------------------|-------------|-------------|-------------|-------------|
| <b>First Run</b>    |             |             |             |             |
| Limit [dBuV]        | 66          | 56          | 56          | 60          |
| Dynamic Thr [dB]    | 0           | 0           | 0           | 0           |
| Short               | 0           | 0           | 0           | 0           |
| Long                | 0           | 0           | 0           | 0           |
| Long (10< t ≤20 ms) | 0           | 0           | 0           | 0           |
| Tot. Clicks Corr    | 0           | 0           | 0           | 0           |
| Events              | 0           | 0           | 0           | 0           |
| Time(s)             | 0.00        | 0.00        | 0.00        | 0.00        |
| Sw.Op.              | 0           | 0           | 0           | 0           |
| 5.4.3.5 events      | 0           | 0           | 0           | 0           |
| N                   | 0.00        | 0.00        | 0.00        | 0.00        |
|                     | <b>PASS</b> | <b>PASS</b> | <b>PASS</b> | <b>PASS</b> |

|         |           |         |           |
|---------|-----------|---------|-----------|
| 150 kHz | No Clicks | 500 kHz | No Clicks |
| 1.4 MHz | No Clicks | 30 MHz  | No Clicks |

New Limit [dBuV]

Allowed Clicks

Dynamic Thr [dB]

SECOND PASS NOT ALLOWED

Short

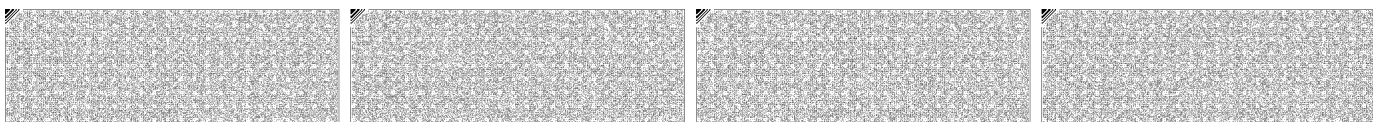
Long

Tot. Clicks Corr

Events

Time(s)

5.4.3.5 events



## 7.5 Magnetic Field Strength (9 kHz to 30 MHz)

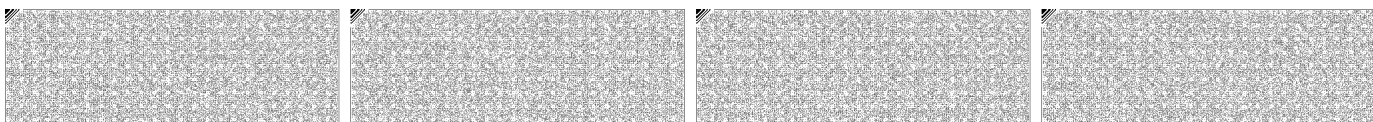
| EN IEC 55014-1<br>(CISPR 14-1)   | Magnetic Field Strength 9 kHz to 30 MHz |                                    | Result                   |
|--|---|------------------------------------|--------------------------|
| <b>Method:</b> Measurements were made on a 10 meters anechoic chamber that complies to CISPR 16.<br>Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meters with the receive antenna located at 1 meter height in both horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360°. All frequencies were investigated in both horizontal and vertical antenna polarity. |   |                                    | <b>Not Applicable</b>    |
| Fully configured sample scanned over the following frequency range   | Frequency range                         | Measurement distance               |                          |
|  | 9 kHz - 30 MHz                          | 3 m measurement distance           |                          |
| EUT mode<br>(Refer to clauses 4)   | Test configuration mode                 | N/A                                |                          |
|  | EUT Operation mode                      | N/A                                |                          |
|  | Power Interface mode                    | N/A                                |                          |
| <b>Magnetic Field Strength limits and testing methods for the frequency range 9 kHz to 30 MHz</b>  |   |                                    |                          |
| Standard   | Frequency range (MHz)                   | Limit / dB $\mu$ V/m<br>Quasi-peak | Remark                   |
| CISPR 16-2-3   | 0.009 to 0.07                           | 69                                 | Measurement distance 3 m |
|  | 0.07 to 0.15                            | 69 to 39                           |                          |
|  | 0.15 to 4                               | 39 to 3                            |                          |
|  | 4 to 30                                 | 3                                  |                          |
| NOTE 1. The lower limit is applicable at the transition frequency.   |   |                                    |                          |
| NOTE 2. The measurements are performed at 3 m distance with a 0,6 m loop antenna as described in 4.3.2 of CISPR 16-1-4:2019.   |   |                                    |                          |
| NOTE 3. The antenna shall be installed vertically, with the lower edge of the loop at 1 m height above the floor.  |   |                                    |                          |
| NOTE 4. The limit decreases linearly with the logarithm of the frequency in the range 0.07 MHz to 4 MHz.   |   |                                    |                          |

| Measurement Instrument |       |              |            |           |          |
|------------------------|-------|--------------|------------|-----------|----------|
| Description            | Model | Manufacturer | Identifier | Cal. Date | Cal. Due |
| -                      | -     | -            | -          | -         | -        |

**Calculation**

|  |
|--|
| Result(dB $\mu$ V/m) : Reading Value(dB $\mu$ V) + Cable loss(dB) - Pre amplifier gain(dB) + Ant. Factor(dB) |
|--|

|   |
|---|
| Margin(dB) : Limit(dB $\mu$ V/m) - Result(dB $\mu$ V/m) |
|---|



| Magnetic Field Strength 9 kHz to 30 MHz _ Test setup photo |     |                    |     |
|--|-----|--------------------|-----|
| Test configuration mode                                    | N/A | EUT Operation mode | N/A |
| N/A  |     |                    |     |

| Magnetic Field Strength 9 kHz to 30 MHz _ Measurement data |     |                      |     |
|--|-----|----------------------|-----|
| Test configuration mode                                    | N/A | EUT Operation mode   | N/A |
| Test voltage (V)   | N/A | Frequency (DC/AC-Hz) | N/A |



## 7.6 Radiated Disturbance

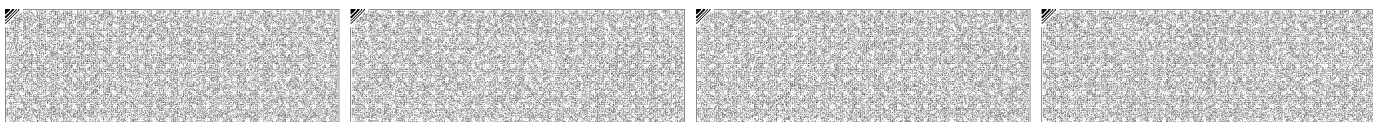
| EN IEC 55014-1<br>(CISPR 14-1)  | Radiated disturbance 30 MHz – 6 GHz |   | Result |
|---|-------------------------------------|---|--------|
| <p><u>Method:</u> Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10 meter below 1GHz and 3 meter above 1GHz. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak detector below 1GHz and CISPR-average detector above 1GHz) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.</p> |                                     | <b>Not Applicable</b>                   |        |
| Fully configured sample scanned over the following frequency range  | Frequency range                     | Measurement distance                    |        |
|   | 30 MHz – 1 GHz                      | 10 m measurement distance               |        |
|   | 1 GHz – 6 GHz                       | 3 m measurement distance                |        |
| EUT mode<br>(Refer to clauses 4)  | Test configuration mode             | N/A                                     |        |
|   | EUT Operation mode                  | N/A                                     |        |
|   | Power Interface mode                | N/A                                     |        |
| <b>Radiated Disturbance below 1 000 MHz at a measuring distance of 10 m</b>   |                                     |   |        |
| Frequency range (MHz)   | Quasi-peak limit dB $\mu$ V/m       |   |        |
| 30 to 230   | 30                                  |   |        |
| 230 to 1 000  | 37                                  |   |        |
| <b>Radiated Disturbance for above 1 000 MHz at a measurement distance of 3 m</b>  |                                     |   |        |
| Frequency range (GHz)   | Peak limit dB $\mu$ V/m             | Average limit dB $\mu$ V/m              |        |
| 1 to 3  | 70                                  | 50                                      |        |
| 3 to 6  | 74                                  | 54                                      |        |
| <b>Required highest frequency for radiated electric field strength measurements</b>   |                                     |   |        |
| Highest clock frequency ( $F_x$ )   |                                     | Highest measurement frequency           |        |
| $F_x \leq 108$ MHz  |                                     | 1 GHz                                   |        |
| $108$ MHz $< F_x \leq 500$ MHz  |                                     | 2 GHz                                   |        |
| $500$ MHz $< F_x \leq 1$ GHz  |                                     | 5 GHz                                   |        |
| $F_x > 1$ GHz   |                                     | $5 \times F_x$ up to a maximum of 6 GHz |        |

| Measurement Instrument |       |              |            |           |          |
|------------------------|-------|--------------|------------|-----------|----------|
| Description            | Model | Manufacturer | Identifier | Cal. Date | Cal. Due |
| -                      | -     | -            | -          | -         | -        |

## Calculation

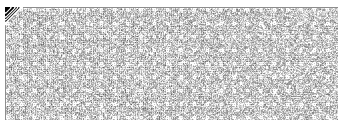
|  |
|--|
| Result(dB $\mu$ V/m) : Reading Value(dB $\mu$ V) + Cable loss(dB) - Pre amplifier gain(dB) + Ant. Factor(dB) |
|--|

|   |
|---|
| Margin(dB) : Limit(dB $\mu$ V/m) - Result(dB $\mu$ V/m) |
|---|



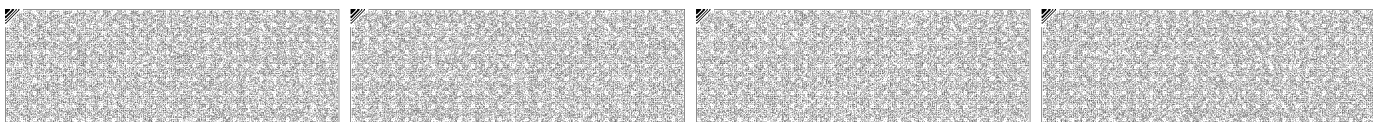
| Radiated disturbance at (30 ~ 1 000) MHz _ Test setup photo |     |                    |     |
|---|-----|--------------------|-----|
| Test configuration mode                                     | N/A | EUT Operation mode | N/A |
| N/A   |     |                    |     |

| Radiated disturbance at (30 ~ 1 000) MHz _ Measurement data |     |                      |     |
|---|-----|----------------------|-----|
| Test configuration mode                                     | N/A | EUT Operation mode   | N/A |
| Test voltage (V)  | N/A | Frequency (DC/AC-Hz) | N/A |



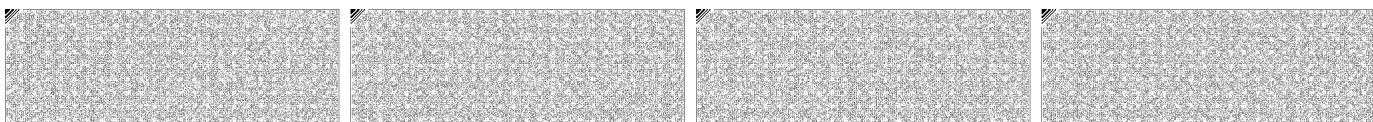
## 7.7 Harmonic current emissions


| EN IEC 61000-3-2<br>(IEC 61000-3-2)  | Harmonic current emissions          |   | Result |
|--|-------------------------------------|---|--------|
| <b>Method:</b> This test consists on the measurement of harmonics components of the input current which may be produced by equipment having an input current up to and including 16 A per phase, and intended to be connected to public low-voltage distribution systems. The equipment is tested under specified conditions of operation.   |                                     | <b>Comply</b>   |        |
| <b>EUT mode<br/>(Refer to clauses 4)</b>   | <b>Test configuration mode</b>      | 1   |        |
|  | <b>EUT Operation mode</b>           | 1, 2  |        |
|  | <b>Power Interface mode</b>         | 1   |        |
| <b>Classification in accordance with the standard</b>  | <input checked="" type="checkbox"/> | Class A   |        |
|  | <input type="checkbox"/>            | Class B   |        |
|  | <input type="checkbox"/>            | Class C with active input power > 25 W  |        |
|  | <input type="checkbox"/>            | Class C with active input power ≤ 25 W<br>(First requirement, Table 3 column 2)   |        |
|  | <input type="checkbox"/>            | Class C with active input power ≤ 25 W (Second requirement)   |        |
|  | <input type="checkbox"/>            | Class D   |        |
| <b>Classification of equipment</b>   | Class A                             | <ul style="list-style-type: none"> <li>- balanced three-phase equipment</li> <li>- household appliances, excluding equipment identified as class D</li> <li>- tools, excluding portable tools</li> <li>- dimmers for incandescent lamps</li> <li>- audio equipment</li> <li>- equipments not specified in one of the three other classes</li> </ul> |        |
|  | Class B                             | <ul style="list-style-type: none"> <li>- portable tools</li> <li>- arc welding equipment which is not professional equipment</li> </ul>   |        |
|  | Class C                             | <ul style="list-style-type: none"> <li>- lighting equipment</li> </ul>  |        |
|  | Class D                             | <ul style="list-style-type: none"> <li>- Equipment specified power less than or equal to 600 W of the following types</li> <li>- personal computers and personal computer monitors</li> <li>- television receiver</li> <li>- refrigerators and freezers having one or more variable-speed drives to control compressor motor(s)</li> </ul>          |        |
| <p>1) According to IEC 61000-3-2 the manufacturer shall specify the power of the apparatus. This value shall be used for establishing limits; the specified power shall be within ±10 % of the measured power.</p> <p>2) Limit are not specified for</p> <ul style="list-style-type: none"> <li>- Equipment with a rated power of 75 W or less (other than lighting equipment)</li> <li>- Professional equipment with a total rated power greater than 1 kW</li> <li>- Symmetrically controlled heating elements with a rated power less than or equal to 200 W</li> <li>- Independent dimmers for incandescent lamps with a rated power less than or equal to 1 kW</li> </ul> |                                     |   |        |

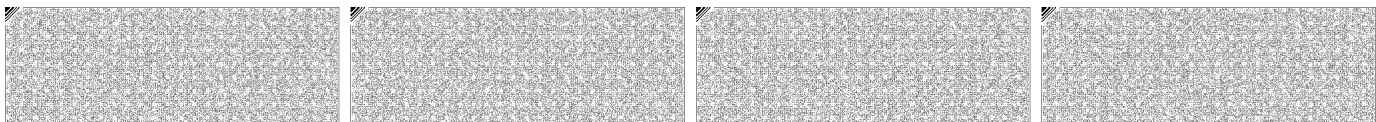


| Harmonic Current Emission Limit  |   |   |   |
|--|---|---|---|
| - Limit for Class A equipment  |   |   |   |
| Harmonic order (n)   | Maximum permissible<br>Harmonic current (A)   | Harmonic order (n)                          | Maximum permissible<br>Harmonic current (A) |
| Odd harmonics  |   | Even harmonics                              |   |
| 3  | 2.30  | 2   | 1.08  |
| 5  | 1.14  | 4   | 0.43  |
| 7  | 0.77  | 6   | 0.3   |
| 9  | 0.40  | $8 \leq n \leq 40$                          | 0.23 8/n                                    |
| 11   | 0.33  |   |   |
| 13   | 0.21  |   |   |
| $15 \leq n \leq 39$  | 0.15 15/n   |   |   |
| - Limit for Class B equipment  |   |   |   |
| It shall not exceed the value give in Class A multiplied by a factor of 1.5. |   |   |   |
| - Limit for Class C equipment  |   |   |   |
| Harmonic order (n)   | Maximum permissible harmonic current expressed as a percentage<br>of the input current at the fundamental frequency % |   |   |
| 2  | 2   |   |   |
| 3  | 30·λ(λ is the circuit power factor)   |   |   |
| 5  | 10  |   |   |
| 7  | 7   |   |   |
| 9  | 5   |   |   |
| $11 \leq n \leq 39$<br>(odd harmonics only)                                  | 3   |   |   |
| - Limit for Class D equipment  |   |   |   |
| Harmonic order (n)   | Maximum permissible<br>Harmonic current per watt (mA/W)   | Maximum permissible<br>Harmonic current (A) |   |
| 3  | 3.4   | 2.30  |   |
| 5  | 1.9   | 1.14  |   |
| 7  | 1.0   | 0.77  |   |
| 9  | 0.5   | 0.40  |   |
| 11   | 0.35  | 0.33  |   |
| $13 \leq n \leq 39$<br>(odd harmonics only)                                  | 3.85/n  | See Class A                                 |   |

| Measurement Instrument                |                |              |             |            |            |
|---------------------------------------|----------------|--------------|-------------|------------|------------|
| Description                           | Model          | Manufacturer | Identifier  | Cal. Date  | Cal. Due   |
| MULTIFUNCTION AC / DC<br>POWER SOURCE | NETWAVE 60-400 | EM TEST      | P1311115470 | 2025-02-03 | 2026-02-02 |
| DIGITAL POWER<br>ANALYZER             | DPA 503N       | EM TEST      | P1303109858 | 2025-02-05 | 2026-02-04 |
| THREE-PHASE FLICKER<br>IMPEDANCE      | AIF 503N63     | EM TEST      | P1311114936 | 2025-02-03 | 2026-02-02 |

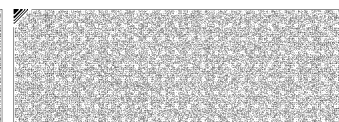
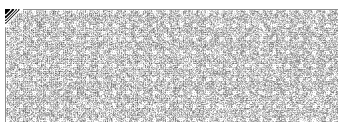


| Harmonic current emissions _ Test setup photo                                       |   |                    |      |
|---|---|--------------------|------|
| Test configuration mode   | 1 | EUT Operation mode | 1, 2 |
|  |   |                    |      |





| Climatic Conditions |   |                 |         |
|---------------------|---|-----------------|---------|
| Temperature :       | 21 °C   | Pressure :      | 100 kPa |
|                     |   | Humidity :      | 53 %    |
| Devices             |   |                 |         |
| Device :            | DPA503N   |                 |         |
| Interface :         | USB   | Firmware :      | 6.13    |
| Measures & Analysis |   |                 |         |
| Measure Window :    | 10 periods  | Voltage Range : | 500 V   |
| Refresh Interval :  | 2 s   | Current Range : | 70 A    |
| Sampling Rate :     | 6.4 kS/s  |                 |         |
| Scaled Window :     | Rectangular   |                 |         |
| According :         | IEC 61000-3-2 (Edition 5.1)<br>Limits for harmonic current emissions (equipment input current < 16 A per phase) |                 |         |
| Measure Results     |   |                 |         |



**Standard Specific Results for IEC 61000-3-2 (Edition 5.1)**

|                    |  |
|--------------------|--|
| Standard Group:    | Industry   |
| Standard Name:     | IEC 61000-3-2 (Edition 5.1)  |
|                    | Limits for harmonic current emissions (equipment input current < 16 A per phase) |
| Device Under Test: | PASS   |
| Power Source:      | PASS   |
| Connection Type:   | L - N  |
| Main Line:         | 230 V, 50 Hz   |
| Classification:    | Class A  |
| Appli. of Limits:  | less than or equal to 150 % (Without POHC Enhancement)                           |
|                    | <b>Current limits are disabled because rated power is less than 75W.</b>         |

| Evaluation of Partial Odd Harmonics Enhancement |                            |                         |                         |
|---|----------------------------|-------------------------|-------------------------|
| <i>Partial Odd Harmonic Currents</i>            |                            |                         |                         |
|   | <i>measured value</i>      | <i>limit</i>            | <i>result</i>           |
| Line 1:   | 0.011 A (3.21 %)           | -                       | PASS                    |
| <i>Evaluation for current limits</i>            |                            |                         |                         |
|   | <i>without enhancement</i> | <i>with enhancement</i> | <i>need enhancement</i> |
| Line 1:   | PASS                       | PASS                    | No                      |
| Enhancement is not applied                      |                            |                         |                         |

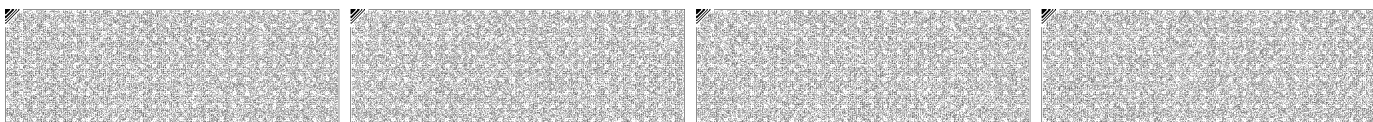
| Check Harmonics 2.40                            |              |
|---|--------------|
| <i>First detected harmonic order &gt; 150 %</i> | Line 1: None |
| <i>Harmonics orders &gt; 150 %</i>              | Line 1: None |
| <i>Harmonics orders with average &gt; 100 %</i> | Line 1: None |

| Measured values             |                    |
|-----------------------------|--------------------|
| <i>Fundamental Current</i>  | Line 1: 0.341 A    |
| <i>Active input Power</i>   | Line 1: 64.516 W * |
| <i>Circuit power factor</i> | Line 1: 0.815 *    |

\* Absolute value.

**Current Test Result**

| Hn | Average and Maximum harmonic current results ** |              |           |        |                      |              |           |        | Harmonic Result |
|----|---|--------------|-----------|--------|----------------------|--------------|-----------|--------|-----------------|
|    | Average   |              |           |        | Maximum              |              |           |        |                 |
|    | I <sub>eff</sub> [A]                            | of Limit [%] | Limit [A] | Result | I <sub>eff</sub> [A] | of Limit [%] | Limit [A] | Result |                 |
|    |   |              |           |        |                      |              |           |        |                 |



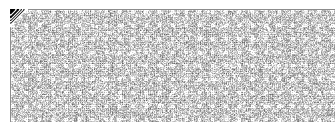
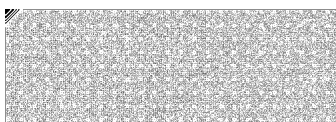
|    |       |  |  |       |  |  |  |
|----|-------|--|--|-------|--|--|--|
| 1  | 0.341 |  |  | 0.341 |  |  |  |
| 2  | 0.001 |  |  | 0.001 |  |  |  |
| 3  | 0.010 |  |  | 0.010 |  |  |  |
| 4  | 0.001 |  |  | 0.001 |  |  |  |
| 5  | 0.014 |  |  | 0.014 |  |  |  |
| 6  | 0.000 |  |  | 0.000 |  |  |  |
| 7  | 0.014 |  |  | 0.014 |  |  |  |
| 8  | 0.000 |  |  | 0.000 |  |  |  |
| 9  | 0.013 |  |  | 0.013 |  |  |  |
| 10 | 0.000 |  |  | 0.000 |  |  |  |
| 11 | 0.012 |  |  | 0.012 |  |  |  |
| 12 | 0.000 |  |  | 0.000 |  |  |  |
| 13 | 0.011 |  |  | 0.011 |  |  |  |
| 14 | 0.001 |  |  | 0.002 |  |  |  |
| 15 | 0.013 |  |  | 0.014 |  |  |  |
| 16 | 0.001 |  |  | 0.001 |  |  |  |
| 17 | 0.009 |  |  | 0.009 |  |  |  |
| 18 | 0.000 |  |  | 0.000 |  |  |  |
| 19 | 0.008 |  |  | 0.008 |  |  |  |
| 20 | 0.000 |  |  | 0.000 |  |  |  |
| 21 | 0.007 |  |  | 0.007 |  |  |  |
| 22 | 0.000 |  |  | 0.000 |  |  |  |
| 23 | 0.006 |  |  | 0.006 |  |  |  |
| 24 | 0.000 |  |  | 0.000 |  |  |  |
| 25 | 0.004 |  |  | 0.004 |  |  |  |
| 26 | 0.000 |  |  | 0.000 |  |  |  |
| 27 | 0.004 |  |  | 0.004 |  |  |  |
| 28 | 0.000 |  |  | 0.000 |  |  |  |
| 29 | 0.003 |  |  | 0.003 |  |  |  |
| 30 | 0.000 |  |  | 0.000 |  |  |  |
| 31 | 0.002 |  |  | 0.002 |  |  |  |
| 32 | 0.000 |  |  | 0.000 |  |  |  |
| 33 | 0.001 |  |  | 0.001 |  |  |  |
| 34 | 0.000 |  |  | 0.000 |  |  |  |
| 35 | 0.001 |  |  | 0.001 |  |  |  |
| 36 | 0.000 |  |  | 0.000 |  |  |  |
| 37 | 0.001 |  |  | 0.001 |  |  |  |
| 38 | 0.000 |  |  | 0.000 |  |  |  |
| 39 | 0.001 |  |  | 0.001 |  |  |  |
| 40 | 0.000 |  |  | 0.000 |  |  |  |

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

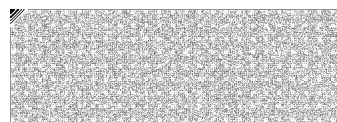
\*\* Current limits are disabled because rated power is less than 75W.

#### Voltage Source Verification

| Harmonic voltage results |          |          |           |        |
|--------------------------|----------|----------|-----------|--------|
| Hn                       | Ueff [V] | Ueff [%] | Limit [%] | Result |
| 1                        | 230.922  | 100.401  |           |        |



|    |       |       |       |      |
|----|-------|-------|-------|------|
| 2  | 0.171 | 0.074 | 0.200 | PASS |
| 3  | 0.061 | 0.027 | 0.900 | PASS |
| 4  | 0.070 | 0.030 | 0.200 | PASS |
| 5  | 0.041 | 0.018 | 0.400 | PASS |
| 6  | 0.050 | 0.022 | 0.200 | PASS |
| 7  | 0.058 | 0.025 | 0.300 | PASS |
| 8  | 0.035 | 0.015 | 0.200 | PASS |
| 9  | 0.061 | 0.026 | 0.200 | PASS |
| 10 | 0.028 | 0.012 | 0.200 | PASS |
| 11 | 0.034 | 0.015 | 0.100 | PASS |
| 12 | 0.023 | 0.010 | 0.100 | PASS |
| 13 | 0.033 | 0.014 | 0.100 | PASS |
| 14 | 0.025 | 0.011 | 0.100 | PASS |
| 15 | 0.016 | 0.007 | 0.100 | PASS |
| 16 | 0.020 | 0.009 | 0.100 | PASS |
| 17 | 0.022 | 0.009 | 0.100 | PASS |
| 18 | 0.021 | 0.009 | 0.100 | PASS |
| 19 | 0.016 | 0.007 | 0.100 | PASS |
| 20 | 0.017 | 0.007 | 0.100 | PASS |
| 21 | 0.014 | 0.006 | 0.100 | PASS |
| 22 | 0.017 | 0.007 | 0.100 | PASS |
| 23 | 0.016 | 0.007 | 0.100 | PASS |
| 24 | 0.007 | 0.003 | 0.100 | PASS |
| 25 | 0.013 | 0.006 | 0.100 | PASS |
| 26 | 0.011 | 0.005 | 0.100 | PASS |
| 27 | 0.012 | 0.005 | 0.100 | PASS |
| 28 | 0.014 | 0.006 | 0.100 | PASS |
| 29 | 0.020 | 0.009 | 0.100 | PASS |
| 30 | 0.006 | 0.003 | 0.100 | PASS |
| 31 | 0.022 | 0.009 | 0.100 | PASS |
| 32 | 0.013 | 0.006 | 0.100 | PASS |
| 33 | 0.014 | 0.006 | 0.100 | PASS |
| 34 | 0.010 | 0.005 | 0.100 | PASS |
| 35 | 0.016 | 0.007 | 0.100 | PASS |
| 36 | 0.013 | 0.006 | 0.100 | PASS |
| 37 | 0.014 | 0.006 | 0.100 | PASS |
| 38 | 0.008 | 0.003 | 0.100 | PASS |
| 39 | 0.010 | 0.004 | 0.100 | PASS |
| 40 | 0.016 | 0.007 | 0.100 | PASS |





#### Climatic Conditions

|               |       |            |         |            |      |
|---------------|-------|------------|---------|------------|------|
| Temperature : | 21 °C | Pressure : | 100 kPa | Humidity : | 53 % |
|---------------|-------|------------|---------|------------|------|

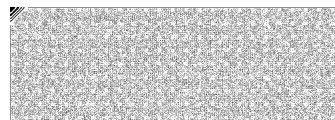
#### Devices

|             |         |            |      |
|-------------|---------|------------|------|
| Device :    | DPA503N |            |      |
| Interface : | USB     | Firmware : | 6.13 |

#### Measures & Analysis

|                    |   |                 |       |
|--------------------|---|-----------------|-------|
| Measure Window :   | 10 periods  | Voltage Range : | 500 V |
| Refresh Interval : | 2 s   | Current Range : | 70 A  |
| Sampling Rate :    | 6.4 kS/s  |                 |       |
| Scaled Window :    | Rectangular   |                 |       |
| According :        | IEC 61000-3-2 (Edition 5.1)<br>Limits for harmonic current emissions (equipment input current < 16 A per phase) |                 |       |

#### Measure Results



**Standard Specific Results for IEC 61000-3-2 (Edition 5.1)**

|                    |   |
|--------------------|---|
| Standard Group:    | Industry  |
| Standard Name:     | IEC 61000-3-2 (Edition 5.1)<br>Limits for harmonic current emissions (equipment input current < 16 A per phase) |
| Device Under Test: | PASS  |
| Power Source:      | PASS  |
| Connection Type:   | L - N   |
| Main Line:         | 230 V, 50 Hz  |
| Classification:    | Class A   |
| Appli. of Limits:  | less than or equal to 150 % (Without POHC Enhancement)  |

**Current limits are disabled because rated power is less than 75W.**

| Evaluation of Partial Odd Harmonics Enhancement |                            |                         |                         |
|---|----------------------------|-------------------------|-------------------------|
| <i>Partial Odd Harmonic Currents</i>            |                            |                         |                         |
|   | <i>measured value</i>      | <i>limit</i>            | <i>result</i>           |
| Line 1:   | 0.011 A (3.4 %)            | -                       | PASS                    |
| <i>Evaluation for current limits</i>            |                            |                         |                         |
|   | <i>without enhancement</i> | <i>with enhancement</i> | <i>need enhancement</i> |
| Line 1:   | PASS                       | PASS                    | No                      |
| Enhancement is not applied                      |                            |                         |                         |

| Check Harmonics 2.40                            |      |
|---|------|
| <i>First detected harmonic order &gt; 150 %</i> |      |
| Line 1:   | None |
| <i>Harmonics orders &gt; 150 %</i>              |      |
| Line 1:   | None |
| <i>Harmonics orders with average &gt; 100 %</i> |      |
| Line 1:   | None |

| Measured values             |            |
|-----------------------------|------------|
| <i>Fundamental Current</i>  |            |
| Line 1:                     | 0.327 A    |
| <i>Active input Power</i>   |            |
| Line 1:                     | 64.648 W * |
| <i>Circuit power factor</i> |            |
| Line 1:                     | 0.85 *     |

\* Absolute value.

**Current Test Result**

| Hn | Average and Maximum harmonic current results ** |              |           |        |                      |              |           |        | Harmonic Result |
|----|---|--------------|-----------|--------|----------------------|--------------|-----------|--------|-----------------|
|    | Average   |              |           |        | Maximum              |              |           |        |                 |
|    | I <sub>eff</sub> [A]                            | of Limit [%] | Limit [A] | Result | I <sub>eff</sub> [A] | of Limit [%] | Limit [A] | Result |                 |
|    |   |              |           |        |                      |              |           |        |                 |



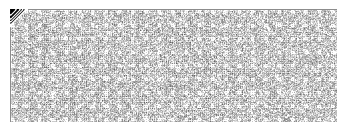
|    |       |  |  |  |       |  |  |  |  |
|----|-------|--|--|--|-------|--|--|--|--|
| 1  | 0.327 |  |  |  | 0.327 |  |  |  |  |
| 2  | 0.001 |  |  |  | 0.001 |  |  |  |  |
| 3  | 0.010 |  |  |  | 0.010 |  |  |  |  |
| 4  | 0.001 |  |  |  | 0.001 |  |  |  |  |
| 5  | 0.014 |  |  |  | 0.014 |  |  |  |  |
| 6  | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 7  | 0.014 |  |  |  | 0.014 |  |  |  |  |
| 8  | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 9  | 0.013 |  |  |  | 0.013 |  |  |  |  |
| 10 | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 11 | 0.012 |  |  |  | 0.012 |  |  |  |  |
| 12 | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 13 | 0.011 |  |  |  | 0.012 |  |  |  |  |
| 14 | 0.001 |  |  |  | 0.001 |  |  |  |  |
| 15 | 0.013 |  |  |  | 0.014 |  |  |  |  |
| 16 | 0.001 |  |  |  | 0.001 |  |  |  |  |
| 17 | 0.009 |  |  |  | 0.009 |  |  |  |  |
| 18 | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 19 | 0.008 |  |  |  | 0.008 |  |  |  |  |
| 20 | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 21 | 0.007 |  |  |  | 0.007 |  |  |  |  |
| 22 | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 23 | 0.006 |  |  |  | 0.006 |  |  |  |  |
| 24 | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 25 | 0.005 |  |  |  | 0.005 |  |  |  |  |
| 26 | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 27 | 0.004 |  |  |  | 0.004 |  |  |  |  |
| 28 | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 29 | 0.003 |  |  |  | 0.003 |  |  |  |  |
| 30 | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 31 | 0.002 |  |  |  | 0.002 |  |  |  |  |
| 32 | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 33 | 0.001 |  |  |  | 0.001 |  |  |  |  |
| 34 | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 35 | 0.001 |  |  |  | 0.001 |  |  |  |  |
| 36 | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 37 | 0.001 |  |  |  | 0.001 |  |  |  |  |
| 38 | 0.000 |  |  |  | 0.000 |  |  |  |  |
| 39 | 0.001 |  |  |  | 0.001 |  |  |  |  |
| 40 | 0.000 |  |  |  | 0.000 |  |  |  |  |

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

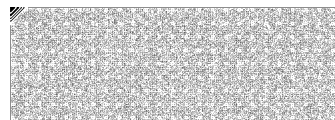
\*\* Current limits are disabled because rated power is less than 75W.

#### Voltage Source Verification

| Harmonic voltage results |          |          |           |        |
|--------------------------|----------|----------|-----------|--------|
| Hn                       | Ueff [V] | Ueff [%] | Limit [%] | Result |
| 1                        | 230.923  | 100.402  |           |        |



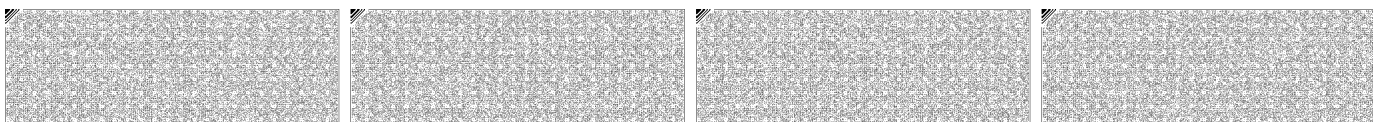
|    |       |       |       |      |
|----|-------|-------|-------|------|
| 2  | 0.172 | 0.075 | 0.200 | PASS |
| 3  | 0.062 | 0.027 | 0.900 | PASS |
| 4  | 0.070 | 0.030 | 0.200 | PASS |
| 5  | 0.043 | 0.019 | 0.400 | PASS |
| 6  | 0.050 | 0.022 | 0.200 | PASS |
| 7  | 0.058 | 0.025 | 0.300 | PASS |
| 8  | 0.035 | 0.015 | 0.200 | PASS |
| 9  | 0.060 | 0.026 | 0.200 | PASS |
| 10 | 0.028 | 0.012 | 0.200 | PASS |
| 11 | 0.033 | 0.014 | 0.100 | PASS |
| 12 | 0.024 | 0.010 | 0.100 | PASS |
| 13 | 0.033 | 0.014 | 0.100 | PASS |
| 14 | 0.024 | 0.010 | 0.100 | PASS |
| 15 | 0.016 | 0.007 | 0.100 | PASS |
| 16 | 0.018 | 0.008 | 0.100 | PASS |
| 17 | 0.021 | 0.009 | 0.100 | PASS |
| 18 | 0.020 | 0.009 | 0.100 | PASS |
| 19 | 0.017 | 0.007 | 0.100 | PASS |
| 20 | 0.018 | 0.008 | 0.100 | PASS |
| 21 | 0.013 | 0.006 | 0.100 | PASS |
| 22 | 0.016 | 0.007 | 0.100 | PASS |
| 23 | 0.017 | 0.008 | 0.100 | PASS |
| 24 | 0.008 | 0.004 | 0.100 | PASS |
| 25 | 0.012 | 0.005 | 0.100 | PASS |
| 26 | 0.009 | 0.004 | 0.100 | PASS |
| 27 | 0.012 | 0.005 | 0.100 | PASS |
| 28 | 0.013 | 0.006 | 0.100 | PASS |
| 29 | 0.019 | 0.008 | 0.100 | PASS |
| 30 | 0.005 | 0.002 | 0.100 | PASS |
| 31 | 0.021 | 0.009 | 0.100 | PASS |
| 32 | 0.011 | 0.005 | 0.100 | PASS |
| 33 | 0.014 | 0.006 | 0.100 | PASS |
| 34 | 0.011 | 0.005 | 0.100 | PASS |
| 35 | 0.017 | 0.007 | 0.100 | PASS |
| 36 | 0.015 | 0.007 | 0.100 | PASS |
| 37 | 0.018 | 0.008 | 0.100 | PASS |
| 38 | 0.006 | 0.003 | 0.100 | PASS |
| 39 | 0.011 | 0.005 | 0.100 | PASS |
| 40 | 0.014 | 0.006 | 0.100 | PASS |




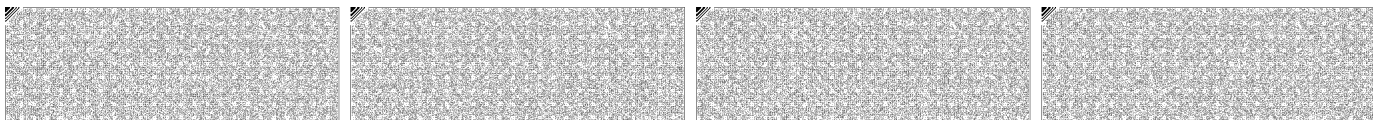
## 7.8 Voltage change, fluctuations and flicker

| EN 61000-3-3<br>(IEC 61000-3-3)  | Voltage change, fluctuations and flicker |  | Result        |
|--|--|--|---------------|
| <b>Method:</b> EUT was connected to the Power Analyzer system. Measurements were conducted to obtain the desired flicker parameters. The measuring time depends on which parameters are to be measured. The measurement was performed with the test software |  |  | <b>Comply</b> |
| EUT mode<br>(Refer to clauses 4)   | Test configuration mode                  | 1  |               |
|  | EUT Operation mode                       | 1, 2   |               |
|  | Power Interface mode                     | 1  |               |
| parameters   | $P_{st}$                                 | the short-term flicker indicator, $P_{st}$ , shall not be greater than 1.0   |               |
|  | $P_{lt}$                                 | the long-term flicker indicator, $P_{lt}$ , shall not be greater than 0.65   |               |
|  | $T_{max}$                                | $T_{max}$ the accumulated time value of $d(t)$ with a deviation exceeding 3,3 % during a single voltage change at the EUT terminals, shall not exceed 500 ms   |               |
|  | $d_c$                                    | The maximum relative steady-state voltage change, $d_c$ , shall not exceed 3.3 %   |               |
|  | $d_{max}$                                | The maximum relative voltage change $d_{max}$ , shall not exceed<br>4 % without additional conditions<br>6 % for equipment which is switched manually, if any<br>7 % for equipment which is attended whilst in use |               |

| Measurement Instrument             |                |              |             |            |            |
|------------------------------------|----------------|--------------|-------------|------------|------------|
| Description                        | Model          | Manufacturer | Identifier  | Cal. Date  | Cal. Due   |
| MULTIFUNCTION AC / DC POWER SOURCE | NETWAVE 60-400 | EM TEST      | P1311115470 | 2025-02-03 | 2026-02-02 |
| DIGITAL POWER ANALYZER             | DPA 503N       | EM TEST      | P1303109858 | 2025-02-05 | 2026-02-04 |
| THREE-PHASE FLICKER IMPEDANCE      | AIF 503N63     | EM TEST      | P1311114936 | 2025-02-03 | 2026-02-02 |



| Voltage change, fluctuations and flicker _ Test setup photo                         |   |                    |      |
|---|---|--------------------|------|
| Test configuration mode   | 1 | EUT Operation mode | 1, 2 |
|  |   |                    |      |



| Voltage change, fluctuations and flicker _ Measurement data |        |                      |    |
|---|--------|----------------------|----|
| Test configuration mode                                     | 1      | EUT Operation mode   | 1  |
| Test voltage (V)  | AC 230 | Frequency (DC/AC-Hz) | 50 |

### Test Report

Report Number : DTNC2507-05081  
 Test Standard : IEC 61000-3-3 (Ed3-2) - General Test conditions (230V - 50Hz)  
 Test Date : 7/7/2025 11:22:49 AM

### Result

E.U.T. : PASS  
 Remark : HIGH



**Climatic Conditions**

|               |       |            |         |            |      |
|---------------|-------|------------|---------|------------|------|
| Temperature : | 21 °C | Pressure : | 100 kPa | Humidity : | 53 % |
|---------------|-------|------------|---------|------------|------|

**Devices**

|             |         |            |      |
|-------------|---------|------------|------|
| Device :    | DPA503N |            |      |
| Interface : | USB     | Firmware : | 6.13 |



### Flicker Results

#### Standard Specific Results for IEC 61000-3-3 (Edition 3.2)

|                  |   |
|------------------|---|
| Standard Group:  | Industry  |
| Standard Name:   | IEC 61000-3-3 (Edition 3.2)<br>Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current $\leq 16$ A per phase and not subject to conditional connection |
| Test Condition:  | General Test Conditions   |
| Analysis Status: | PASS  |

#### Flicker Measurements Settings

|                    |             |
|--------------------|-------------|
| Main Line:         | 230V, 50Hz  |
| Flicker Meter:     | 230V / 50Hz |
| Flicker Impedance: | Zref        |
| Observation Time:  | 12 × 10 min |
| Measurements:      | 12          |

#### Flicker Measurements

|          | $P_{fl}$ | Max $P_{st}$ | Max $d_c$ | Max $d_{max}$ | Max $T_{max}$ |
|----------|----------|--------------|-----------|---------------|---------------|
| Line 1:  | 0.028    | 0.028        | 0         | 0.257         | 0             |
| Limits:  | 0.65     | 1            | 3.3       | 4             | 0.5           |
| Results: | PASS     | PASS         | PASS      | PASS          | PASS          |

#### Flicker Individual Measurements

| Measurement | $P_{st}$ [ ] |       |        | $d_c$ [%] |       |        | $d_{max}$ [%] |       |        | $T_{max}$ [s] |       |        |
|-------------|--------------|-------|--------|-----------|-------|--------|---------------|-------|--------|---------------|-------|--------|
|             | Value        | Limit | Result | Value     | Limit | Result | Value         | Limit | Result | Value         | Limit | Result |
| #1          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | 0.26          | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #2          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | 0.05          | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #3          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | 0.05          | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #4          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | 0.05          | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #5          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | 0.05          | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #6          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | 0.05          | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #7          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | 0.04          | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #8          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | 0.05          | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #9          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | 0.05          | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #10         | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | 0.04          | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #11         | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | 0.05          | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #12         | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | 0.05          | 4.00  | PASS   | 0.00          | 0.50  | PASS   |

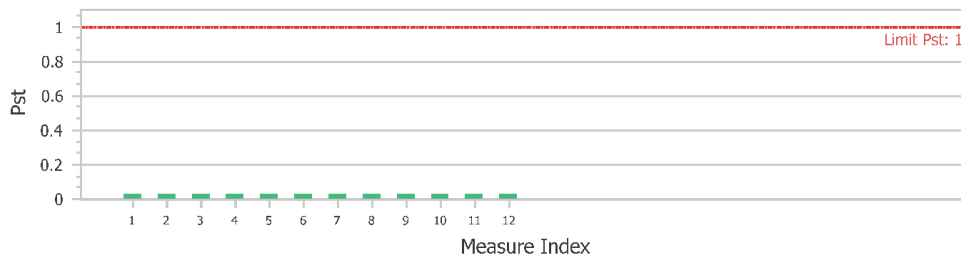


## Pst Data

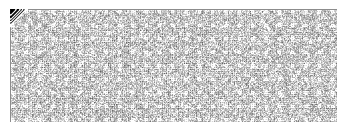
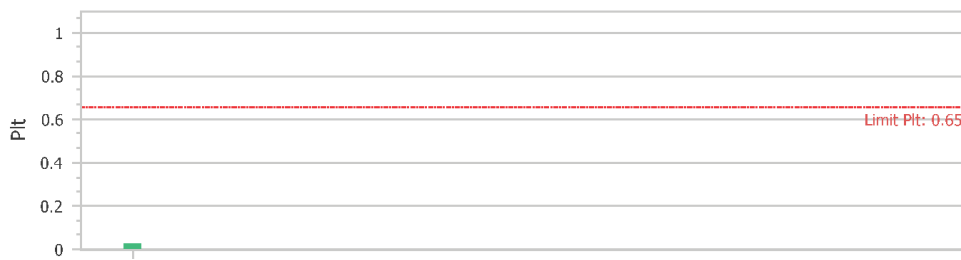
## Flicker (Line 1)

| Meas. No. | P0,1 | P1s | P3s | P10s  | P50s  | Pst   | dc [%] | dmax [%] | Tmax [s] |
|-----------|------|-----|-----|-------|-------|-------|--------|----------|----------|
| 1         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.257    | 0        |
| 2         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.046    | 0        |
| 3         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.047    | 0        |
| 4         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.048    | 0        |
| 5         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.046    | 0        |
| 6         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.048    | 0        |
| 7         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.044    | 0        |
| 8         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.049    | 0        |
| 9         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.048    | 0        |
| 10        | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.045    | 0        |
| 11        | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.05     | 0        |
| 12        | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.049    | 0        |

## Short-term Flicker Severity (Pst) (Line 1)



## Long-term Flicker Severity (Plt) (Line 1)



| Voltage change, fluctuations and flicker _ Measurement data |        |                      |    |
|---|--------|----------------------|----|
| Test configuration mode                                     | 1      | EUT Operation mode   | 2  |
| Test voltage (V)  | AC 230 | Frequency (DC/AC-Hz) | 50 |

### Test Report

Report Number : DTNC2507-05081  
 Test Standard : IEC 61000-3-3 (Ed3-2) - General Test conditions (230V - 50Hz)  
 Test Date : 7/7/2025 1:28:03 PM

### Result

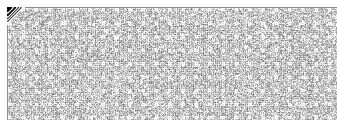
E.U.T. : Passed  
 Remark : MIDDLE



| Climatic Conditions |       |            |         |            |      |
|---------------------|-------|------------|---------|------------|------|
| Temperature :       | 21 °C | Pressure : | 100 kPa | Humidity : | 53 % |

| Devices     |         |            |      |
|-------------|---------|------------|------|
| Device :    | DPA503N |            |      |
| Interface : | USB     | Firmware : | 6.13 |



### Flicker Results

#### Standard Specific Results for IEC 61000-3-3 (Edition 3.2)

|                  |   |
|------------------|---|
| Standard Group:  | Industry  |
| Standard Name:   | IEC 61000-3-3 (Edition 3.2)<br>Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current $\leq 16$ A per phase and not subject to conditional connection |
| Test Condition:  | General Test Conditions   |
| Analysis Status: | PASS  |

#### Flicker Measurements Settings

|                    |             |
|--------------------|-------------|
| Main Line:         | 230V, 50Hz  |
| Flicker Meter:     | 230V / 50Hz |
| Flicker Impedance: | Zref        |
| Observation Time:  | 12 × 10 min |
| Measurements:      | 12          |

#### Flicker Measurements

|          | $P_{fl}$ | Max $P_{st}$ | Max $d_c$ | Max $d_{max}$ | Max $T_{max}$ |
|----------|----------|--------------|-----------|---------------|---------------|
| Line 1:  | 0.028    | 0.028        | 0         | < 0.2         | 0             |
| Limits:  | 0.65     | 1            | 3.3       | 4             | 0.5           |
| Results: | PASS     | PASS         | PASS      | PASS          | PASS          |

#### Flicker Individual Measurements

| Measurement | $P_{st}$ [ ] |       |        | $d_c$ [%] |       |        | $d_{max}$ [%] |       |        | $T_{max}$ [s] |       |        |
|-------------|--------------|-------|--------|-----------|-------|--------|---------------|-------|--------|---------------|-------|--------|
|             | Value        | Limit | Result | Value     | Limit | Result | Value         | Limit | Result | Value         | Limit | Result |
| #1          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | < 0.2         | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #2          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | < 0.2         | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #3          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | < 0.2         | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #4          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | < 0.2         | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #5          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | < 0.2         | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #6          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | < 0.2         | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #7          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | < 0.2         | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #8          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | < 0.2         | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #9          | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | < 0.2         | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #10         | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | < 0.2         | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #11         | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | < 0.2         | 4.00  | PASS   | 0.00          | 0.50  | PASS   |
| #12         | 0.03         | 1.00  | PASS   | 0.00      | 3.30  | PASS   | < 0.2         | 4.00  | PASS   | 0.00          | 0.50  | PASS   |

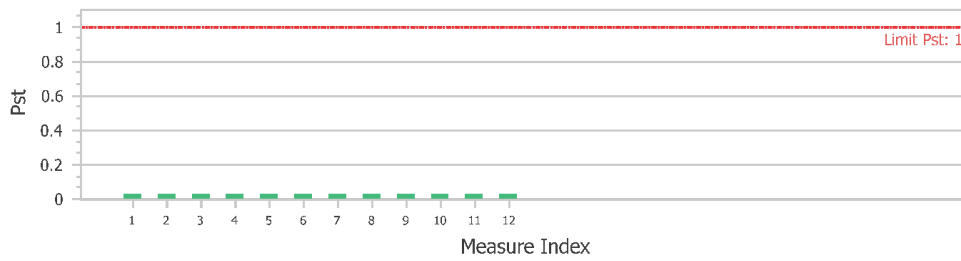


## Pst Data

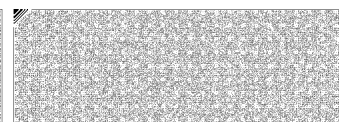
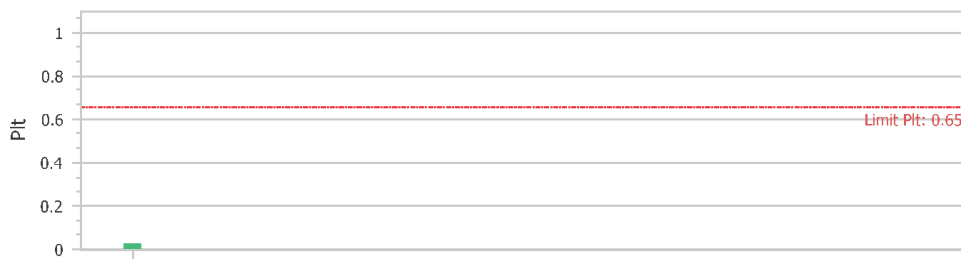
## Flicker (Line 1)

| Meas. No. | P0,1 | P1s | P3s | P10s  | P50s  | Pst   | dc [%] | dmax [%] | Tmax [s] |
|-----------|------|-----|-----|-------|-------|-------|--------|----------|----------|
| 1         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.044    | 0        |
| 2         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.048    | 0        |
| 3         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.047    | 0        |
| 4         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.048    | 0        |
| 5         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.051    | 0        |
| 6         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.047    | 0        |
| 7         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.044    | 0        |
| 8         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.048    | 0        |
| 9         | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.044    | 0        |
| 10        | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.048    | 0        |
| 11        | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.05     | 0        |
| 12        | 0    | 0   | 0   | 0.001 | 0.005 | 0.028 | 0      | 0.046    | 0        |

## Short-term Flicker Severity (Pst) (Line 1)



## Long-term Flicker Severity (Plt) (Line 1)



## 8. Test Results : Immunity

### Application of tests for the different categories of apparatus

Category I equipment is deemed to comply with the immunity requirements of this document without testing.

#### Category II

| Environmental phenomenon             | Performance criterion | Test specifications (see subclause) |
|--------------------------------------|-----------------------|-------------------------------------|
| Electrostatic discharges             | B                     | 5.1                                 |
| Electric fast transients             | B                     | 5.2                                 |
| Injected currents 150 kHz to 230 MHz | A                     | 5.3                                 |
| Surge                                | B                     | 5.6                                 |
| Voltage dips                         | C                     | 5.7                                 |

#### Category III

| Environmental phenomenon  | Performance criterion | Test specifications (see subclause) |
|---|-----------------------|-------------------------------------|
| Electrostatic discharges  | B/C <sup>a</sup>      | 5.1                                 |
| Electric fast transients  | B                     | 5.2                                 |
| Injected currents 150 kHz to 80 MHz   | A                     | 5.4                                 |
| Radio frequency electromagnetic fields <sup>b, c</sup><br>80 MHz to (F) MHz | A                     | 5.5                                 |
| Surge   | B                     | 5.6                                 |

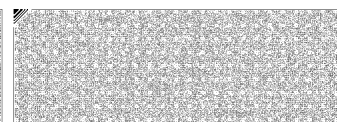
a Performance criterion C may be applied to toys not using score or data entered by the user (e.g.musical soft toys and sounding toys).

b The frequency (F), up to which this test needs to be performed, is determined from either Table 17 or Table 18, according to the principle for distinguishing between categories IV and V.

c For Category III toys, the radio frequency electromagnetic fields test shall be applicable only for ride on toys.

#### Category IV

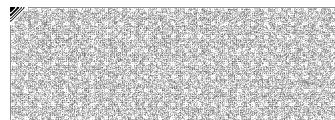
| Environmental phenomenon                                      | Performance criterion | Test specifications (see subclause) |
|---|-----------------------|-------------------------------------|
| Electrostatic discharges                                      | B                     | 5.1                                 |
| Electric fast transients                                      | B                     | 5.2                                 |
| Injected currents 150 kHz to 80 MHz                           | A                     | 5.4                                 |
| Radio frequency electromagnetic fields<br>80 MHz to 1 000 MHz | A                     | 5.5                                 |
| Surge   | B                     | 5.6                                 |
| Voltage dips  | C                     | 5.7                                 |



## Category V

| Environmental phenomenon                               | Performance criterion | Test specifications (see subclause) |
|--|-----------------------|-------------------------------------|
| Electrostatic discharges                               | B                     | 5.1                                 |
| Electric fast transients                               | B                     | 5.2                                 |
| Injected currents 150 kHz to 80 MHz                    | A                     | 5.4                                 |
| Radio frequency electromagnetic fields 80 MHz to 6 GHz | A                     | 5.5                                 |
| Surge  | B                     | 5.6                                 |
| Voltage dips   | C                     | 5.7                                 |

| Performance criteria as defined by the standard |  |
|---|--|
| Criterion                                       | Description from standard  |
| A   | The apparatus shall continue to operate as intended during the test.<br>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.   |
| B   | The apparatus shall continue to operate as intended after the test.<br>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 to persist after the test. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended. |
| 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.   |
| Other:  | -  |



| Functions<br>(non-exhaustive)          | Criteria |                |                 |                 |
|--|----------|----------------|-----------------|-----------------|
|  | A        | B <sup>b</sup> | C1 <sup>c</sup> | C2 <sup>c</sup> |
| Motor speed                            | 10 % a   | -              | +               | -               |
| Torque                                 | 10 % a   | -              | +               | -               |
| Movement                               | 10 % a   | -              | +               | -               |
| Power (consumption, input)             | 10 % a   | -              | +               | -               |
| Switching (change of state)            | -        | -              | +               | -               |
| Heating                                | 10 % a   | -              | +               | -               |
| Timing (programme, delay, duty cycle)  | 10 % a   | -              | +               | -               |
| Stand-by                               | -        | -              | d               | -               |
| Data storage                           | -        | -              | e               | e               |
| Sensor functions (signal transmission) | f        | -              | g               | -               |
| Indicators (visual and acoustic)       | f        | -              | g               | -               |
| Audio function                         | f        | -              | g               | -               |
| Illumination                           | f        | -              | g               | -               |

- No change allowed.  
+ Change allowed.  
a Values are exclusive of the measurement accuracy.  
b For criterion B, measurement or verification is performed during the stable operations of the Equipment Under Test before and after the application of the specified phenomenon.  
c For criterion C, distinction is made between  
C1: before resetting and  
C2: after resetting.  
d Switching-off is allowed, switching-on is not allowed.  
e Loss or change of data is allowed.  
f Lower performance as specified by the manufacturer is allowed, but no loss of correct function.  
g Loss of correct functions allowed.



The equipment covered by this document is subdivided into categories. For each category, specific requirements are formulated.

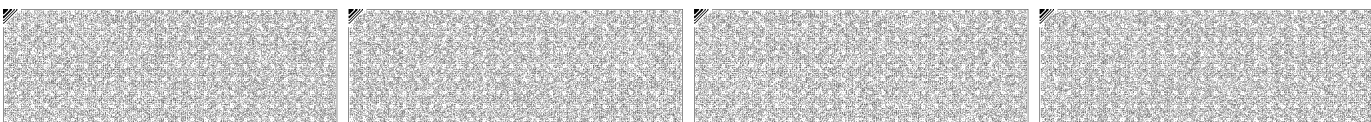
| Category | Description from standard  |
|----------|--|
| I        | <p>Equipment containing no electronic control circuitry.</p> <p><b>EXAMPLES</b> - Appliances, tools and toys that contain no electronic control circuits and only electromechanical components such as switches, thermostats, brush motors, induction motors, heating elements, lighting toys containing only batteries and LED.</p> <p>Electrical circuits consisting of passive components (such as radio interference suppression capacitors or inductors, mains transformers, mains frequency rectifiers) are not considered to be electronic control circuitry.</p>   |
| II       | mains operated equipment containing electronic control circuitry with no clock frequency higher than 15 MHz.   |
| III      | <p>Battery operated equipment not included in Category I.</p> <p><b>EXAMPLES</b> - Appliances, tools and toys powered by batteries and that include a microprocessor to provide a selection of functions.</p> <p>NOTE The assignment to Category III is independent of the clock frequency.</p> <p>This category also includes equipment provided with rechargeable batteries, which can be charged, directly or indirectly, from the mains. Accordingly, this equipment shall also be subjected to the test requirements for mains operated equipment but only when testing the charging function.</p> <p>If the equipment can operate its intended functions when connected, directly or indirectly to the mains, then it is not battery operated. Accordingly, it shall be classified as Category II, Category IV or Category V, as applicable, and subjected to the corresponding test requirements when in mains operation.</p> |
| IV       | Mains operated equipment containing electronic control circuitry with a highest clock frequency greater than 15 MHz but lower than or equal to 200 MHz.  |
| V        | Mains operated equipment containing electronic control circuitry with a highest clock frequency greater than 200 MHz.  |




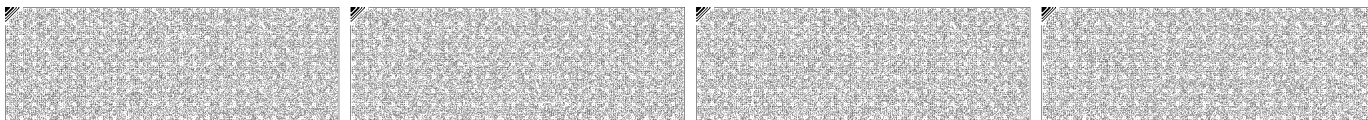
## 8.1 Electrostatic Discharge

| EN IEC 55014-2<br>(CISPR 14-2)  | Electrostatic Discharge  | Result        |                         |  |  |   |                    |      |                      |
|---|--|---------------|-------------------------|--|--|---|--------------------|------|----------------------|
| <b>Method:</b><br>The test set-up was made accordance with <b>EN/IEC 61000-4-2</b> .<br>A ground reference plane was located on the floor, and connected to earth via a low impedance connection.<br>The return cable of the ESD generator was connected to the reference plane.<br>In case of table top equipment, EUT was placed on the reference plane on 80 cm of insulating support.<br>And a vertical coupling plane (VCP) of (0.5 x 0.5) m was located 10 cm from the EUT's sides.<br>The VCP was connected to the reference plane via a cable with a 470 k $\Omega$ (2ea) resistor.<br>The test was made by applying contact and air discharges to the EUT and contact discharges to the VCP/HCP.<br>When applying the discharges to the VCP the tip of the generator was located at the middle edge of the VCP. The VCP was located 10 cm from each side of the EUT.<br>Contact discharges were applied to various points of the EUT at conductive surfaces and to the HCP/VCP.<br>Air discharges were applied to various points of the EUT at non-conductive surfaces.<br>Tests with other (lower) voltages than those given in below table are not required. |  | <b>Comply</b> |                         |  |  |   |                    |      |                      |
| <b>EUT mode<br/>(Refer to clauses 4)</b>  | <table border="1"> <thead> <tr> <th>Test configuration mode</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td style="text-align: center;">1</td> </tr> <tr> <th>EUT Operation mode</th> <td style="text-align: center;">1, 2</td> </tr> <tr> <th>Power Interface mode</th> <td style="text-align: center;">1</td> </tr> </tbody> </table> |               | Test configuration mode |  |  | 1 | EUT Operation mode | 1, 2 | Power Interface mode |
| Test configuration mode   |  |               |                         |  |  |   |                    |      |                      |
|   | 1  |               |                         |  |  |   |                    |      |                      |
| EUT Operation mode  | 1, 2   |               |                         |  |  |   |                    |      |                      |
| Power Interface mode  | 1  |               |                         |  |  |   |                    |      |                      |
| <b>Test spec</b>  |  |               |                         |  |  |   |                    |      |                      |
| Direct : Air Discharges<br>Contact Discharges   | 8 kV<br>4 kV   |               |                         |  |  |   |                    |      |                      |
| Indirect : HCP ( Floor-stand product excluded )<br>VCP  | 4 kV   |               |                         |  |  |   |                    |      |                      |
| Polarity  | + and -  |               |                         |  |  |   |                    |      |                      |
| Number of discharges per point for each voltage and polarity<br>Air Discharge<br>Contact Discharge  | 10<br>10   |               |                         |  |  |   |                    |      |                      |
| Discharge impedance   | 330 $\Omega$ / 150 pF  |               |                         |  |  |   |                    |      |                      |
| Discharge Repetition  | $\geq 1$ sec   |               |                         |  |  |   |                    |      |                      |
| Performance criteria  | B  |               |                         |  |  |   |                    |      |                      |

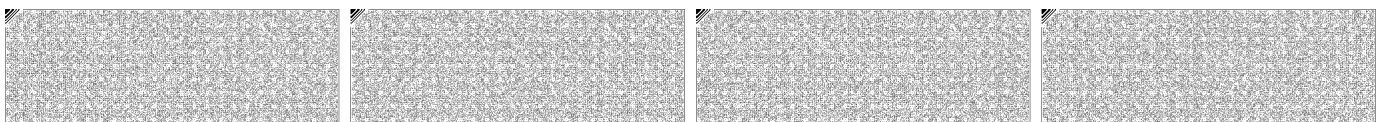
| Measurement Instrument         |          |              |            |            |            |
|--------------------------------|----------|--------------|------------|------------|------------|
| Description                    | Model    | Manufacturer | Identifier | Cal. Date  | Cal. Due   |
| ELECTROSTATIC DISCHARGE SYSTEM | ESS-2000 | NOISEKEN     | ESS0675752 | 2025-01-09 | 2026-01-08 |
| ESD GUN                        | TC-815R  | NOISEKEN     | ESS0675835 | 2025-01-09 | 2026-01-08 |




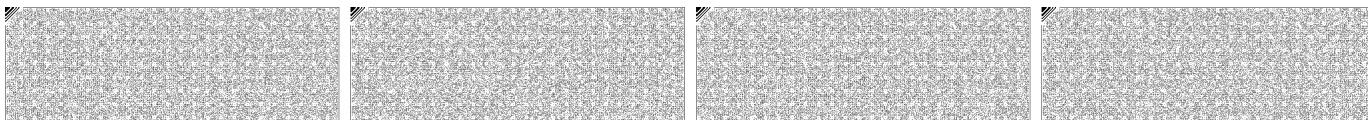
| Electrostatic discharge _ Test setup photo  |   |                    |      |
|---|---|--------------------|------|
| Test configuration mode   | 1 | EUT Operation mode | 1, 2 |
|  |   |                    |      |



| Electrostatic discharge position photo |   |                     |      |
|--|---|---------------------|------|
| Test configuration mode                | 1 | EUT Operation mode  | 1, 2 |
|  |   |                     |      |
|  |   |                     |      |
| Air Discharge :                        |   | Contact Discharge : |      |



| Electrostatic discharge position photo  |   |  |      |
|---|---|--|------|
| Test configuration mode   | 1 | EUT Operation mode                                     | 1, 2 |
|  |   |  |      |
| Air Discharge : <span style="color: blue;">→</span>                                 |   | Contact Discharge : <span style="color: red;">→</span> |      |



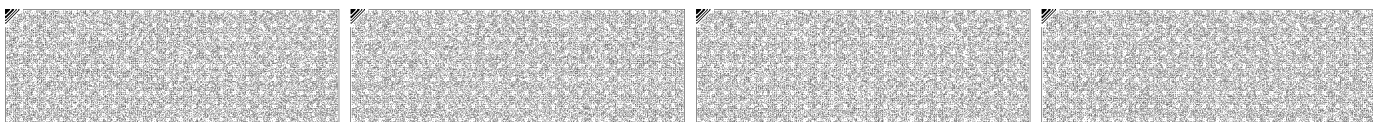
| Electrostatic discharge _ Test result   |                           |                   |                    |                      |             |
|---|---------------------------|-------------------|--------------------|----------------------|-------------|
| Test configuration mode   |                           | 1                 | EUT Operation mode |                      | 1, 2        |
| <b>Indirect Discharge</b>   |                           |                   |                    |                      |             |
| No.   | Position                  | Kind of Discharge | Test level         | Performance Criteria | Result      |
| 1   | Horizontal Coupling Plane | Contact           | ±4 kV              | B                    | N/A Note 1) |
| 2   | Vertical Coupling Plane   |                   |                    |                      | A           |
| <b>Direct Discharge</b>   |                           |                   |                    |                      |             |
| No.   | Position                  | Kind of Discharge | Test level         | Performance Criteria | Result      |
| 1   | Enclosure                 | Contact           | ±4 kV              | B                    | A           |
| 2   | Screw                     |                   |                    |                      | A           |
| 3   | Display                   | Air               | ±8 kV              |                      | A           |
| 4   | Button                    |                   |                    |                      | A           |
| Note 1) Since the EUT is a floor-mounted equipment, the HCP test is excluded. |                           |                   |                    |                      |             |



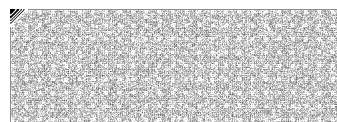
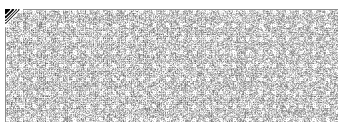
## 8.2 Radio-Frequency Electromagnetic Field

| EN IEC 55014-2<br>(CISPR 14-2)  | Radio-frequency electromagnetic field | Result                |
|---|---------------------------------------|-----------------------|
| <b>Method:</b><br>The test set-up was made accordance with <b>EN/IEC 61000-4-3</b> in semi-anechoic chamber.<br>The EUT has been placed in center of a non-metallic turntable.<br>The height of this table was 0.8 m. The field strength was monitored by an isotropic sensor during the complete test.<br>The isotropic sensor was located beside the equipment.<br>The antenna has been orientated for both horizontal and vertical polarization.<br>The distance between antennas the equipment under testing was at least 3 m.<br>The tests have been performed with the antenna facing each of the four side of the EUT. |                                       | <b>Not Applicable</b> |
| <b>EUT mode<br/>(Refer to clauses 4)</b>  | <b>Test configuration mode</b>        | N/A                   |
|   | <b>EUT Operation mode</b>             | N/A                   |
|   | <b>Power Interface mode</b>           | N/A                   |
| <b>Test Spec</b>  |                                       |                       |
| Field strength  | 3 V/m                                 |                       |
| Frequency range   | 80 MHz ~ 6 GHz <sup>a</sup>           |                       |
| Amplitude Modulation  | AM, 80 %, 1 kHz sine-wave             |                       |
| Step size   | 1 % of fundamental                    |                       |
| Sweep capability  | ≤1.5 x 10 <sup>-3</sup> decade/s      |                       |
| Performance criteria  | A                                     |                       |
| <sup>a</sup> The highest frequency up to which tests need to be performed depends on the category of equipment, see CISPR 14-2 : 2020 7.2.  |                                       |                       |

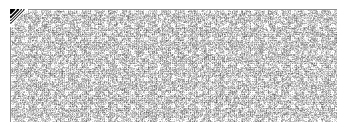
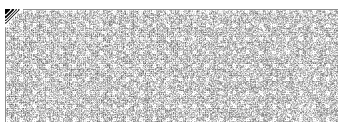
| Measurement Instrument |       |              |            |           |          |
|------------------------|-------|--------------|------------|-----------|----------|
| Description            | Model | Manufacturer | Identifier | Cal. Date | Cal. Due |
| -                      | -     | -            | -          | -         | -        |



| Radio-frequency electromagnetic field _ Test setup photo |     |                    |     |
|--|-----|--------------------|-----|
| Test configuration mode                                  | N/A | EUT Operation mode | N/A |
| N/A  |     |                    |     |



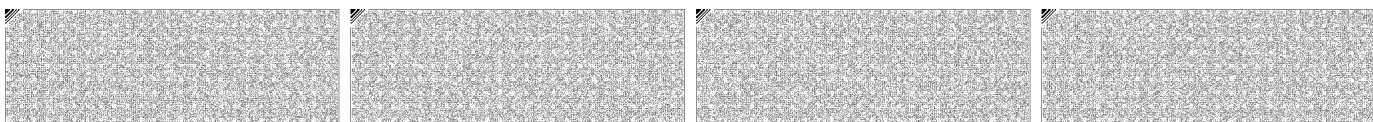
| Radio-frequency electromagnetic field _ Test result _ 80 MHz to 1 GHz |                   |          |                      |                    |        |     |
|---|-------------------|----------|----------------------|--------------------|--------|-----|
| Test configuration mode   |                   |          | N/A                  | EUT Operation mode |        | N/A |
| Test Level (V/m)  | ANT. Polarization | Position | Performance Criteria | Result             | Remark |     |
| 3   | Horizontal        | Left     | A                    | -                  | -      |     |
|   |                   | Right    |                      | -                  | -      |     |
|   |                   | Front    |                      | -                  | -      |     |
|   |                   | Rear     |                      | -                  | -      |     |
|   | Vertical          | Left     |                      | -                  | -      |     |
|   |                   | Right    |                      | -                  | -      |     |
|   |                   | Front    |                      | -                  | -      |     |
|   |                   | Rear     |                      | -                  | -      |     |




### 8.3 Fast Transients

| EN IEC 55014-2<br>(CISPR 14-2)   | Fast Transients                 |  | Result |
|--|---------------------------------|--|--------|
| <b>Method:</b><br>The test set-up was made accordance with <b>EN/IEC 61000-4-4</b> .<br>The EUT has been placed on a wooden table 10 cm above the reference ground plane.<br>The reference ground plane exceeded the projected geometry of the EUT and the capacitive clamp by more than 20 cm. The clamp has placed directly on the reference ground plane.<br>The distance between the EUT and all other conductive structures except the ground plane beneath the EUT was more than 50 cm.<br>The distance between any coupling devices and the EUT shall be (0,5 – 0/+0,1) m for tabletop equipment testing, and (1,0 ± 0,1) m for floor standing equipment. |                                 | <b>Comply</b>  |        |
| <b>EUT mode<br/>(Refer to clauses 4)</b>   | <b>Test configuration mode</b>  | 1  |        |
|  | <b>EUT Operation mode</b>       | 1, 2   |        |
|  | <b>Power Interface mode</b>     | 1  |        |
| <b>Test Spec</b>   |                                 |  |        |
|  | Input and Output AC power ports | Input and Output DC power ports<br>/ Signal ports, control ports and<br>wired network port |        |
| Test voltage (kV)  | 1                               | 0.5  |        |
| Polarity   | + and -                         |  |        |
| Repetition frequency   | 5 kHz                           |  |        |
| Tr/Th ns   | 5 / 50                          |  |        |
| Performance criteria   | B                               |  |        |

| Measurement Instrument                          |            |              |             |            |            |
|---|------------|--------------|-------------|------------|------------|
| Description                                     | Model      | Manufacturer | Identifier  | Cal. Date  | Cal. Due   |
| ULTRA COMPACT SIMULATOR                         | UCS 500 N7 | EM TEST      | V1212112312 | 2024-11-29 | 2025-11-28 |
| COUPLING/DECOUPLING NETWORK FOR BURST AND SURGE | CNI 503 B8 | EM TEST      | V1212112313 | 2024-11-29 | 2025-11-28 |



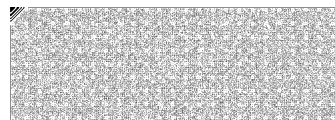
| Fast Transients _ Test setup photo  |   |                    |      |
|---|---|--------------------|------|
| Test configuration mode   | 1 | EUT Operation mode | 1, 2 |
|  |   |                    |      |



| Fast Transients _ Test result of power port |                 |                      |                    |        |      |
|---|-----------------|----------------------|--------------------|--------|------|
| Test configuration mode                     |                 | 1                    | EUT Operation mode |        | 1, 2 |
| Line  | Test Level (kV) | Performance Criteria | Result             | Remark |      |
| N - L1 - PE                                 | +1              | B                    | A                  | -      |      |
|   | -1              |                      | A                  | -      |      |

N : Neutral line, L1 : Live line, PE : Ground line

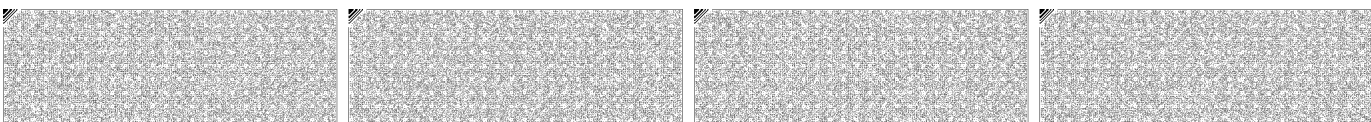
| Fast Transients _ Test result of signal port, control ports and wired network port |                 |                      |        |        |
|--|-----------------|----------------------|--------|--------|
| Line   | Test Level (kV) | Performance Criteria | Result | Remark |
| -  | +0.5            | B                    | -      | -      |
|  | -0.5            |                      | -      | -      |




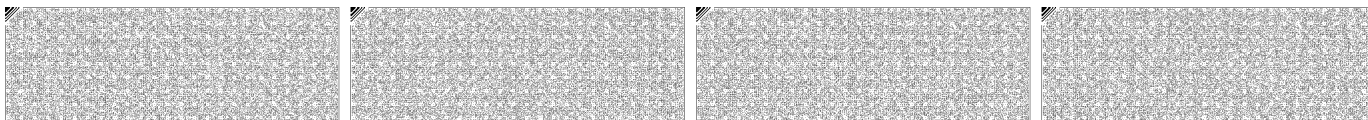
## 8.4 Surges

| EN IEC 55014-2<br>(CISPR 14-2)  | Surges   |  | Result        |
|---|--|--|---------------|
| <p><b>Method:</b><br/>The test set-up was made accordance with <b>EN/IEC 61000-4-5</b>.<br/>The test consists of the injection of slow high energy transients in the AC/DC mains supply lines in both line-to-line and line-to-ground coupling mode, and into the signal and extra low voltage supply lines in line-to-ground coupling mode. The impedance of the transient generator is characterized by the shape of the open-circuit voltage and the circuit current pulses.<br/>To simulate typical installation impedances, 40 are inserted when the generator when extra low voltage and signal lines are tested, and 10 are inserted when the line-to-ground test is conducted on the AC/DC mains lines. The test pulses are coupled into the leads to be tested by means of appropriate coupling networks, which maintain the test pulses within their specification. The reference ground plane exceeded the projected geometry of the EUT and the back filler by more than 20 cm. The back filler has been placed directly on a separated reference ground plane. Both ground planes were connected together. The ground terminal of the back filler has been connected directly with its reference ground plane.<br/>Tests with other (lower) voltages than those given in below table are not required.</p> |  |  | <b>Comply</b> |
| <b>EUT mode<br/>(Refer to clauses 4)</b>  | <b>Test configuration mode</b>                     | <b>1</b>   |               |
|   | <b>EUT Operation mode</b>                          | <b>1, 2</b>  |               |
|   | <b>Power Interface mode</b>                        | <b>1</b>   |               |
| <b>Test Spec</b>  |  |  |               |
|   | Input AC power ports                               | Wired network ports (NOTE 1)                                       |               |
| Test voltage (kV)   | Line to Line : 1<br>Line to Earth : 2              | Shield to Earth (shielded) : 0.5<br>Line to Earth (unshielded) : 1 |               |
| Polarity  | + and -  | + and -  |               |
| Waveshape,<br>open circuit voltage  | 1.2 $\mu$ s / 50 $\mu$ s                           | 1.2 $\mu$ s / 50 $\mu$ s   |               |
| Waveshape,<br>short circuit current   | 8 $\mu$ s / 20 $\mu$ s                             | 8 $\mu$ s / 20 $\mu$ s   |               |
| Phase shifting  | 90° ( positive puses), 270°<br>( negative pulses ) | N/A  |               |
| Repetition rate   | ≤60 sec  | ≤60 sec  |               |
| Number of surges  | 5  | 5  |               |
| Performance criteria  | B  | B  |               |
| NOTE 1) Examples of ports that meet the above condition are typically those supporting xDSL, PSTN and similar communications.<br>LAN and similar are examples of ports that do not meet the above condition.  |  |  |               |
| NOTE 2) Wired network ports which also provide DC power (e.g. Power Over Ethernet) shall be treated as wired network ports only.  |  |  |               |

| Measurement Instrument                          |            |              |             |            |            |
|---|------------|--------------|-------------|------------|------------|
| Description                                     | Model      | Manufacturer | Identifier  | Cal. Date  | Cal. Due   |
| ULTRA COMPACT SIMULATOR                         | UCS 500 N7 | EM TEST      | V1212112312 | 2024-11-29 | 2025-11-28 |
| COUPLING/DECOUPLING NETWORK FOR BURST AND SURGE | CNI 503 B8 | EM TEST      | V1212112313 | 2024-11-29 | 2025-11-28 |



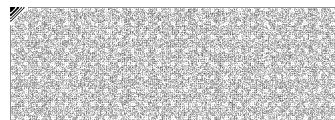
| Surges _ Test setup photo   |   |                    |      |
|---|---|--------------------|------|
| Test configuration mode   | 1 | EUT Operation mode | 1, 2 |
|  |   |                    |      |



| Surges _ Test result of power port |                 |                      |                    |        |      |
|------------------------------------|-----------------|----------------------|--------------------|--------|------|
| Test configuration mode            |                 | 1                    | EUT Operation mode |        | 1, 2 |
| Line                               | Test Level (kV) | Performance Criteria | Result             | Remark |      |
| N - L                              | +1              | B                    | A                  | -      |      |
|                                    | -1              |                      | A                  | -      |      |
| N - PE                             | +2              |                      | A                  | -      |      |
|                                    | -2              |                      | A                  | -      |      |
| L - PE                             | +2              |                      | A                  | -      |      |
|                                    | -2              |                      | A                  | -      |      |

N : Neutral line, L1 : Live line, PE : Earth line

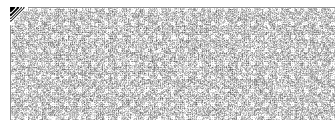
| Surges _ Test result of Wired network ports |                 |                      |                    |        |     |
|---|-----------------|----------------------|--------------------|--------|-----|
| Test configuration mode                     |                 | N/A                  | EUT Operation mode |        | N/A |
| Line  | Test Level (kV) | Performance Criteria | Result             | Remark |     |
| -   | +1              | B                    | -                  | -      |     |
|   | -1              |                      | -                  | -      |     |

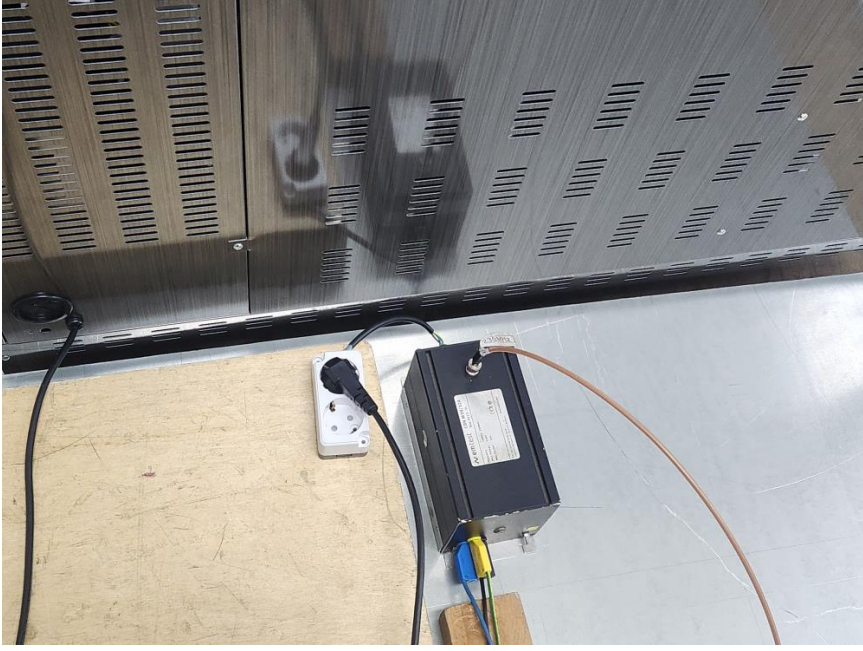


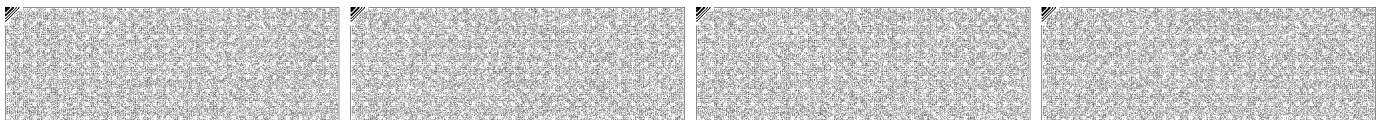
## 8.5 Radio-Frequency Continuous Conducted

| EN IEC 55014-2<br>(CISPR 14-2)  | Radio-Frequency Continuous Conducted                                     |                                 |                                 | Result        |
|---|--|---------------------------------|---------------------------------|---------------|
| <b>Method:</b><br>Test set-up was made according to <b>EN/IEC 61000-4-6</b> .<br>The EUT has been placed on a wooden table 10 cm above the reference ground plane.<br>The reference ground plane exceeded the projected geometry of the EUT and the Coupling /Decoupling Network (CDN) by more than 30 cm. The CDN has been placed directly on the reference ground plane. The cable between CDN and EUT has a length of 30 cm. |  |                                 |                                 | <b>Comply</b> |
| <b>EUT mode<br/>(Refer to clauses 4)</b>  | <b>Test configuration mode</b>   | 1                               |                                 |               |
|   | <b>EUT Operation mode</b>  | 1, 2                            |                                 |               |
|   | <b>Power Interface mode</b>  | 1                               |                                 |               |
| <b>Test Spec</b>  |  |                                 |                                 |               |
| Applied voltage   | Signal ports, control ports and wired network ports                      | Input and output DC power ports | Input and output AC power ports |               |
|   | 1 V  | 1 V                             | 3 V                             |               |
| Frequency range   | 150 kHz ~ 80 MHz (Category III, IV, V)<br>150 kHz ~ 230 MHz(Category II) |                                 |                                 |               |
| Modulation  | AM, 80 %, 1 kHz sine-wave  |                                 |                                 |               |
| Step size   | 1 % of fundamental   |                                 |                                 |               |
| Sweep capability  | 1.5 x 10 <sup>-3</sup> decade/s  |                                 |                                 |               |
| Performance criteria  | A  |                                 |                                 |               |

| Measurement Instrument    |             |              |             |            |            |
|---------------------------|-------------|--------------|-------------|------------|------------|
| Description               | Model       | Manufacturer | Identifier  | Cal. Date  | Cal. Due   |
| CONTINUOUS WAVE SIMULATOR | CWS 500N1   | EM TEST      | P1251106909 | 2025-01-20 | 2026-01-19 |
| ATTENUATOR                | ATT6/75     | EM TEST      | 1012-63     | 2025-03-26 | 2026-03-25 |
| CDN                       | CDN M3N/32A | EM TEST      | 0113-31     | 2025-05-23 | 2026-05-22 |

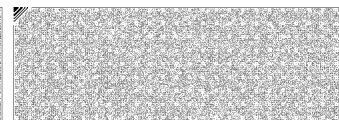


| Radio-frequency continuous conducted _Test setup photo _ power port                 |     |                    |      |
|---|-----|--------------------|------|
| Test configuration mode   | 1   | EUT Operation mode | 1, 2 |
|  |     |                    |      |
| Radio-frequency continuous conducted _Test setup photo _ of Signal port             |     |                    |      |
| Test configuration mode   | N/A | EUT Operation mode | N/A  |
| N/A   |     |                    |      |



| Radio-frequency continuous conducted _Test result of power port |                |                      |                    |        |      |
|---|----------------|----------------------|--------------------|--------|------|
| Test configuration mode   |                | 1                    | EUT Operation mode |        | 1, 2 |
| Port  | Test Level (V) | Performance Criteria | Result             | Remark |      |
| Mains (M3)  | 3              | A                    | A                  | -      |      |
|   |                |                      |                    |        |      |

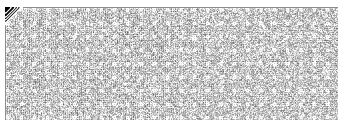
| Radio-frequency continuous conducted _Test result of Signal ports, control ports and wired network ports |                |                      |                    |        |     |
|--|----------------|----------------------|--------------------|--------|-----|
| Test configuration mode  |                | N/A                  | EUT Operation mode |        | N/A |
| Port   | Test Level (V) | Performance Criteria | Result             | Remark |     |
| -  | 1              | A                    | -                  | -      |     |
|  |                |                      |                    |        |     |




## 8.6 Voltage Dips

| EN IEC 55014-2<br>(CISPR 14-2)   | Voltage Dips                   |      |       |              |      |               | Result |
|--|--------------------------------|------|-------|--------------|------|---------------|--------|
| <p><u>Method:</u> The test set-up was made accordance in with <b>EN/IEC 61000-4-11</b>.<br/>The dips/interruptions test is only applicable to AC mains. The dips/interruptions were applied at zero crossings of the voltage wave.</p> |                                |      |       |              |      | <b>Comply</b> |        |
| <b>EUT mode</b><br>(Refer to clauses 4)  | <b>Test configuration mode</b> |      |       | <b>1</b>     |      |               |        |
|  | <b>EUT Operation mode</b>      |      |       | <b>1, 2</b>  |      |               |        |
|  | <b>Power Interface mode</b>    |      |       | <b>1</b>     |      |               |        |
| <b>Test Spec</b>   |                                |      |       |              |      |               |        |
| Voltage Dips   |                                |      |       |              |      |               |        |
| Frequency range  | <b>50 Hz</b>                   |      |       | <b>60 Hz</b> |      |               |        |
| Voltage reduction  | 30 %                           | 60 % | 100 % | 30 %         | 60 % | 100 %         |        |
| Number of periods ( cycle )  | 25                             | 10   | 0.5   | 30           | 12   | 0.5           |        |
| Number of reductions (periods) at each duration  | 3                              |      |       |              |      |               |        |
| Interval between reductions  | ≥10 s                          |      |       |              |      |               |        |
| Performance criteria   | C                              |      |       |              |      |               |        |

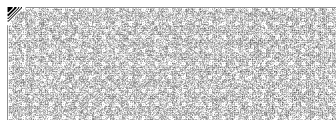
| Measurement Instrument |           |              |             |            |            |
|------------------------|-----------|--------------|-------------|------------|------------|
| Description            | Model     | Manufacturer | Identifier  | Cal. Date  | Cal. Due   |
| POWER FAIL SIMULATOR   | PFS503N63 | EM TEST      | V1212112315 | 2025-03-27 | 2026-03-26 |



| Voltage dips and interruptions _ Test setup photo                                   |   |                    |      |
|---|---|--------------------|------|
| Test configuration mode   | 1 | EUT Operation mode | 1, 2 |
|  |   |                    |      |



| Voltage dips and interruptions _ Test result at 50 Hz  |                      |                   |                         |        |         |
|--|----------------------|-------------------|-------------------------|--------|---------|
| Test configuration mode  |                      | 1                 | EUT Operation mode      |        | 1, 2    |
| Voltage Dips   |                      |                   |                         |        |         |
| Test Level<br>% Ut   | Voltage dips<br>% Ut | Number of periods | Performance<br>Criteria | Result | Remark  |
| 0  | 100                  | 0.5               | C                       | A      | -       |
| 40   | 60                   | 10                |                         | B      | Note 1) |
| 70   | 30                   | 25                |                         | B      | Note 1) |
| Note 1) During the test, the EUT's fan stops operating, but after the test, it operates normally without any intervention from the tester. |                      |                   |                         |        |         |

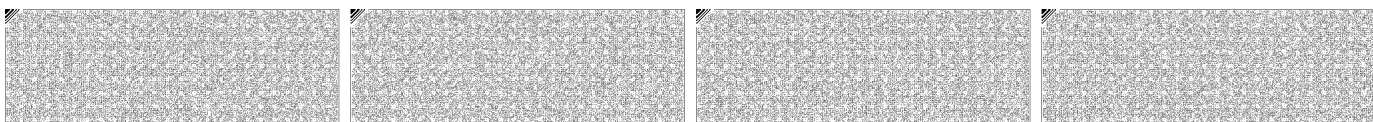


## 9. Photographs of EUT

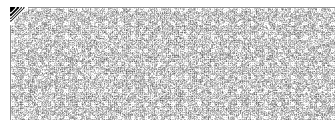
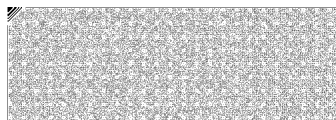
Front View of Product



Rear View of Product



**Inside View of Product**



## 10. Revision History

| Date          | Report No.<br>(Order No.)            | Description    | Revised By   | Reviewed By |
|---------------|--------------------------------------|----------------|--------------|-------------|
| Jul. 25. 2025 | DREKCEE2507-0230<br>(DTNC2507-05081) | Initial report | UkHyeon Kwon | JunHo Park  |
|               |                                      |                |              |             |
|               |                                      |                |              |             |
|               |                                      |                |              |             |
|               |                                      |                |              |             |
|               |                                      |                |              |             |
|               |                                      |                |              |             |

-End of test report-

