Test Report issued under the responsibility of:

TEST REPORT
IEC 61010-1
Safety requirements for electrical equipment for measurement, control, and laboratory use
Part 1: General requirements

Report Number .....:	E331788-D1000-2/A0/C0-CB
Date of issue .....:	2021-11-25
Total number of pages.....:	173
Name of Testing Laboratory preparing the Report.....:	UL International Polska sp. z o.o. Równoległa 4, PL-02-235 Warszawa, Poland
Applicant's name.....:	TDK-LAMBDA UK LTD
Address .....:	KINGSLEY AVENUE ILFRACOMBE DEVON, EX34 8ES UNITED KINGDOM
Test specification:	
Standard .....:	IEC 61010-1:2010, IEC 61010-1:2010/AMD1:2016
Test procedure .....:	CB Scheme
Non-standard test method……..:	N/A
TRF template used .....:	IECEE OD-2020-F1:2020, Ed.1.3
Test Report Form No.....:	IEC61010_1P
Test Report Form Originator.....:	VDE Prüf- und Zertifizierungsinstitut GmbH
Master TRF.....:	2021-04-12

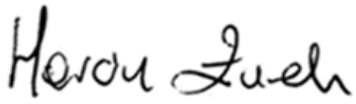
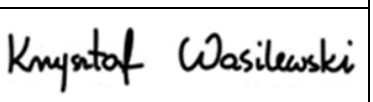
This report is not valid as a CB Test Report unless signed by an approved IECEE Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing NCB. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description.....:	Switch mode power supply
Trade Mark.....:	TDK-Lambda
Manufacturer.....:	Same as Applicant
Model/Type reference.....:	Vega 450, Vega 650, Vega 900, Vega Lite 550 and Vega Lite 750.
Ratings.....:	Vega 450 and Vega Lite 550. PSUs with cooling option F and without xFW and xEW options: Input voltage: 94.5-240 V ac nom., 47-63 Hz, 8.5 A rms max. All other PSUs: Input voltage: 100-240 V ac nom., 47-63 Hz, 8.5 A rms max. Vega 650, Vega Lite 750 and Vega 900. PSUs with cooling option F and without xFW and xEW options: Input voltage: 94.5-240 V ac nom., 47-63 Hz, 12 A rms max. All other PSUs: Input voltage: 100-240 V ac nom., 47-63 Hz, 11 A rms max.

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

[X] **CB Testing Laboratory:**		
Testing location/ address .....:	UL International Polska sp. z o.o. Równoległa 4, PL-02-235 Warszawa, Poland	
Tested by (name, function, signature) .....:	Marcin Zurek (Handler)	
Approved by (name, function, signature) ....:	Krzysztof Wasilewski (Reviewer)	
[ ] **Testing procedure: CTF Stage 1:**		
Testing location/ address .....:		
Tested by (name, function, signature) .....:		
Approved by (name, function, signature) ....:		
[ ] **Testing procedure: CTF Stage 2:**		
Testing location/ address .....:		
Tested by (name, function, signature) .....:		
Witnessed by (name, function, signature) ...:		
Approved by (name, function, signature) ....:		
[x] **Testing procedure: CTF Stage 3:**		
[ ] **Testing procedure: CTF Stage 4:**		

Testing location/ address .....:	TDK-Lambda Ltd, Kingsley Avenue, Ilfracombe, Devon EX34 8ES. United Kingdom	
Tested by (name, function, signature) .....:	Mr K. P. Tizzard (Tester)	See Original Test report for signatures.
Witnessed by(name, function, signature) ....:		
Approved by (name, function, signature) ....:	Mr R. A. Taylor (Reviewer)	See Original Test report for signatures.
Supervised by (name, function, signature) ..:	Manfred Mueller (Handler)	See Original Test report for signatures.

List of Attachments (including a total number of pages in each attachment)		
Document No.	Documents included / attached to this report (description)	Page No.
	Refer to Appendix A of this report. All attachments are included within this report.	

Documents referenced by this report (available on request):		
Document Name or No.	Documents description	Page No.
	Refer to Appendix A of this report. All attachments are included within this report.	

Summary of testing:

Refer to the Test List in Appendix B of this report if testing was performed as part of this evaluation.

Clause	Comment
Refer to the Test List in Appendix B of this report if testing was performed as part of this evaluation.	*Refer to the Test List in Appendix B of this report if testing was performed as part of this evaluation.*

Test Report History:
This report may consist of more than one report and is only valid with additional or previous issued reports:

Report Ref. No.	Item
Refer to Report Modifications under General product information for any modifications made to this report.	

Tests performed (name of test and test clause):	**Testing location:**
Refer to the Test List in Appendix B of this report if testing was performed as part of this evaluation.	*Refer to the Test List in Appendix B of this report if testing was performed as part of this evaluation.*

Summary of compliance with National Differences (List of countries addressed):

USA, Canada, EU Group

[X] The product fulfils the requirements of IEC 61010-1:2010, IEC 61010-1:2010/AMD1:2016.

Statement concerning the uncertainty of the measurement systems used for the tests

(may be required by the product standard or client)

[ ] **Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:**

Procedure number, issue date and title:

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

[ ] **Statement not required by the standard used for type testing**

(Note: When IEC or ISO standard requires a statement concerning the uncertainty of the measurement systems used for tests, this should be reported above. The informative text in parenthesis should be delete in both cases after selecting the applicable option)

Copy of marking plate
The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Refer to the enclosure(s) titled Marking Label in the Enclosures section in Appendix A of this report for a copy.

Test item particulars :	
Type of item:	Laboratory
Description of equipment function:	Switch mode power supply for building in
Connection to mains supply:	None or IEC60320 inlet
Overvoltage category:	II
Pollution degree:	2
Means of protection:	Class I (PE connected)
Environmental conditions:	Normal
For use in wet locations:	No
Equipment mobility:	Built-in
Operating conditions:	continuous
Overall size of equipment (W x D x H)	272x127x63
Mass of equipment (kg):	2.5kg maximum
Marked degree of protection to IEC 60529:	None
Possible test case verdicts:	
- Test case does not apply to the test object .....:	N/A (Not Applicable)
- Test object does meet the requirement .....:	P (Pass)
- Test object does not meet the requirement .....:	F (Fail)
Testing:	
Date of receipt of test item .....:	2013-06-25
Date(s) of performance of tests .....:	2013-07-05 to 2013-07-08

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing NCB. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Throughout this report a point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided .....: Yes

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies)..... : Same as Applicant

PANYU TRIO MICROTRONICS CO LTD
SHIJI INDUSTRIAL ESTATE
DONGYONG
NANSHA
GUANGZHOU

GUANGDONG, 511453 CHINA

General product information and other remarks:

Report Summary

All applicable tests according to the referenced standard(s) have been carried out.

Refer to the Report Modifications for any modifications made to this report.

Product Description

Vega 450, Vega 650, Vega 900, Vega Lite 550 and Vega Lite 750 are switch mode power supply units for building into host equipment. There are essentially 2 converters (450 and 650) and all units use the same modules. The Vega 450 and 550 use the 450 converter whilst the Vega 650, 750 and 900 use the 650 converter.

Additional Information

See Additional Information Enclosure.

Technical Considerations

- The product was investigated to the following standards:

  Main Standard(s):

  IEC 61010-1:2010/AMD1:2016/COR1:2019

  From Country Differences:

  - USA: UL 61010-1, 3rd Edition, May 11, 2012, Revised July 19, 2019
  - Canada: CAN/CSA-C22.2 No. 61010-1(2012-05), 3rd Edition, with revisions through 2018-11
  - EU Group: EN 61010-1:2010/A1:2019 (Edition 3.1)

  Additional Standards:

  -

- The following additional investigations were conducted: -
- The product was not investigated to the following standards or clauses: -
- The following accessories were investigated for use with the product: -
- The product was submitted and tested for use at the maximum recommended ambient temperature (Tmra) of 50°C

For any non-certification testing - Unless specified otherwise in this report, the compliance “Decision Rule” is based on Simple Acceptance (Measurement Uncertainty is not taken into account when making a statement of conformity)

Engineering Conditions of Acceptability

When installed in an end-product, consideration must be given to the following:

This component has been judged on the basis of the creepage and clearances required in the indicated Standards, which would cover the component itself if submitted for Listing: UL 61010-1 3rd Ed.
CAN/CSA 22.2 No. 61010-1-12 3rd Ed.
IEC 61010-1:2010 3rd Ed.
EN 61010-1:2010.
The end-product shall consider that: The complete enclosure does not serve as a fire/electrical/mechanical enclosure
Only the enclosure face of unit with IEC60320 inlets has been assessed an an enclosure.
The need for the following shall be considered in the end-product: Bonding to protective earthing terminal (Class I construction).

Creepage and clearance distances were based on a maximum working voltage of Primary to earthed dead metal: 298Vrms, 392V peak.
Primary to SELV: 328Vrms, 504V peak.

Insulation between primary circuits and accessible dead metal complies with the requirements for Basic insulation
Insulation between primary and secondary circuits complies with the requirements for Reinforced insulation
The following tests shall be performed in the end-product evaluation Temperature test for customer air models and
Dielectric Strength test in accordance with the handbook.
The unit is considered acceptable for use at on a max branch circuit of 20A
The unit is considered acceptable for use in a max ambient of 50°C with up to 65°C for certain custom models.
End-product temperature tests for power supplies shall consider that the following transformers employ the indicated insulation system Main barrier transformer Class F (155°C)
Primary 1A option transformer TX1 Class F (155°C)
Other primary option transformers XTR1, XT1, XQ1 Class A (105°C)
The risk associated with clause 5.4.5 shall be assessed in the end product.
The leakage current tests have been provided for information only. This test must be considered in the end product application.

Report Modifications

Date Modified *(Year-Month-Day)*	Modifications Made (include Report Reference Number)	Modified By
2018-07-10	This report is a re-issue of Test Report Reference No. E331788-A14-CB-1 & Test Certificate Reference No. DK-33984-UL issued 2013-07-25, Test Report Reference No. E331788-A14-CB-1 Amd 1 & Test Certificate Reference No. DK-33984-A1-UL issued 2015-10-08, Test Report Reference No. E331788-A14-CB-1 & Test Certificate Reference No. DK-33984-A2-UL issued 2018-01-17. All test data previously captured has been re-produced in this report in its entirety. This update also includes the following changes to the report: 1. Addition of alternate components having similar or better ratings to previous components detailed in the Critical Components Table 2. Deletion of the Avnet manufacturing location 3. Updated the text in the Model Differences section 4. Updated the text in the Additional Information section No testing was considered necessary to make these changes. Based on the previously conducted testing and the review of product technical documentation including photos, schematics, wiring diagrams and similar, has been determined that the product continues to comply with the standard.	Marcin Zurek
2021-11-25	This report is a reissue of CBTR Ref. No. E331788-D1000-1/A0/C0-CB and CB Test Certificate Ref. No. DK-76098-UL. Based on the previously conducted testing and the review of product technical documentation including photos, schematics, wiring diagrams and similar, has been determined that the product continues to comply with the standard. The report was modified to include the following changes: 1. Standard edition has been upgraded to the latest revision date. 2. Updates to the LoCC - standards has been updated, Licenses attached to the report and alternate Y capacitor Murata RA series with the same ratings was added.	Marcin Zurek

	No testing was deemed necessary.	

Description of model differences:
See Model Differences Enclosure.

Description of special features:
(HV circuits, high pressure systems etc.)

See additional information above.