



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-D1005-1/A0/C0-CB  
**Date of issue** .....: 2019-10-04  
**Total number of pages**.....: 161

**Name of Testing Laboratory** .....: UL International Demko A/S  
**preparing the Report**.....: Borupvang 5A, DK-2750 Ballerup, Denmark

**Applicant's name**.....: TDK-LAMBDA UK LTD  
**Address** .....: KINGSLEY AVE, ILFRACOMBE  
 DEVON, EX34 8ES UNITED KINGDOM

**Test specification:**

**Standard** .....: IEC 61010-1:2010  
**Test procedure** .....: CB Scheme  
**Non-standard test method**.....: N/A

**Test Report Form No.**.....: IEC61010\_1M  
**Test Report Form Originator** .....: VDE Testing and Certification Institute  
**Master TRF** .....: 2018-08-16

**Copyright © 2018 Worldwide System for Conformity Testing and Certification of Electrotechnical Equipment and Components (IECEE), Geneva, Switzerland. All rights reserved.**

This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.




If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.



**This report is not valid as a CB Test Report unless signed by an approved CB 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 CB testing laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

<b>Test item description</b> .....:	Switch Mode Power Supply	
<b>Trade Mark</b> .....:	Trademark image(s):	
		
<b>Manufacturer</b> .....:	Same as Applicant	
<b>Model/Type reference</b> .....:	EFE300Mxy-a-b-cdef-ghijk or Y5J008# or Y5J006#, see model differences for details of models and nomenclature	
<b>Ratings</b> .....:	100-240Vac, 4.9A rms max, 45-440Hz (See model differences for details of ratings)	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/>	<b>CB Testing Laboratory:</b>	
<b>Testing location/ address</b> .....	UL International Demko A/S Borupvang 5A, DK-2750 Ballerup, Denmark	
<b>Tested by (name, function, signature)</b> .....	Hedieh Naderi, Handler	
<b>Approved by (name, function, signature)</b> ... :	Michael Jespersen, Reviewer	
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 1:</b>	
<b>Testing location/ address</b> .....		
<b>Tested by (name, function, signature)</b> .....		
<b>Approved by (name, function, signature)</b> ... :		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 2:</b>	
<b>Testing location/ address</b> .....		
<b>Tested by (name, function, signature)</b> .....		
<b>Witnessed by (name, function, signature)</b> .. :		
<b>Approved by (name, function, signature)</b> ... :		
<input checked="" type="checkbox"/>	<b>Testing procedure: CTF Stage 3:</b>	
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 4:</b>	
<b>Testing location/ address</b> .....	TDK-Lambda UK Limited Kingsley Avenue, Ilfracombe Devon, EX34 8ES United Kingdom	
<b>Tested by (name, function, signature)</b> .....	Matt Carter, Tester	

<b>Witnessed by(name, function, signature) ... :</b>	N/A	
<b>Approved by (name, function, signature) ... :</b>	Michael Jespersen, Approver	
<b>Supervised by (name, function, signature) . :</b>	Hedieh Naderi, Handler	

**List of Attachments (including a total number of pages in each attachment):**

Refer to Appendix A of this report. All attachments are included within this report.

**Summary of testing:****Tests performed (name of test and test clause):**

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

**Testing location:**

TDK-LAMBDA UK LTD  
KINGSLEY AVE, ILFRACOMBE  
DEVON, EX34 8ES, UNITED KINGDOM

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

USA / Canada, Switzerland, Japan, Austria, Denmark, Korea, Republic Of, Slovenia, Sweden, United Kingdom

The product fulfils the requirements of IEC 61010-1:2010.

**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.*

<b>Test item particulars :</b>	
Type of item:	Laboratory
Description of equipment function:	Switch Mode Power Supply for building in
Connection to mains supply:	None
Overvoltage category:	II
Pollution degree:	2
Means of protection:	Class I (PE connected)
Environmental conditions:	Extended (Specify): 0 to 70 C
For use in wet locations:	No
Equipment mobility:	Built-in
Operating conditions:	continuous
Overall size of equipment ( W x D x H)	164mm x 85mm x 41mm maximum
Mass of equipment (kg):	1kg maximum
Marked degree of protection to IEC 60529:	None
<b>Classification of installation and use</b> .....:	For building in
<b>Supply Connection</b> .....:	Built-in
.....:	
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object .....	N/A
- test object does meet the requirement .....	P (Pass)
- test object does not meet the requirement .....	F (Fail)
<b>Testing</b> .....:	
<b>Date of receipt of test item</b> .....	2019-05-23
<b>Date(s) of performance of tests</b> .....	2019-06-11 to 2019-07-01

**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 CB Testing Laboratory. 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 IEC60384-14:**

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)..... :** TDK-LAMBDA UK LTD  
KINGSLEY AVE, LFRACOMBE  
DEVON, EX34 8ES UNITED KINGDOM

PANYU TRIO MICROTRONIC CO LTD  
SHIJI INDUSTRIAL ESTATE, DONGYONG,  
NANSHA

GUANGZHOU GUANGDONG 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**

EFE300M series. Switch mode power supplies for building into end equipment.

**Model Differences**

Description of model differences:

Nominal Input Voltage Range	100 – 240V AC
Maximum Input Voltage Range	90** - 264V AC
Input Frequency	45 – 440* Hz maximum
Maximum Input Current	4.9A rms

\*\*Channel 1 output is linearly derated from 90Vac to 85Vac, 4W per volt to 280W.

All ratings apply for ambient temperatures up to 50°C. From 50 to 70°C the output power is derated at 2.5%/per deg C.

EFE300M or –EFE300M models as described below:

(may be prefixed by NS - # / Where # may be any characters indicating non-safety related model differences) products may additionally be marked with U5x or Y5x where x can be any characters indicating non-safety related model differences.

May be prefixed by SP followed by / or – (SP represents a sales code)

Unit Configuration Code: EFE300Mxy-a-b-cdefghijk

Where:

- x = Nothing or J for Japanese models (may have non-safety differences)  
 y = Blank for Y2 capacitors from output to earth, P for Y1 capacitors from output to earth.  
 a = Channel 1 output voltage: see CH1 in the outputs table below, adjustment range column.  
 b = Standby voltage: see standby voltage table below or 0 for omitted.  
 c = HN for open frame, no fan, with 12V / 1A fan supply.  
 HU for U chassis, no fan, with 12V / 1A fan supply.  
 HC for cover + chassis, no fan, with 12V / 1A fan supply.  
 EC for cover + chassis, end fan (temp controlled).  
 NN for open frame, no fan, no fan supply.  
 NU for U chassis, no fan, no fan supply.  
 NC for cover + chassis, no fan, no fan supply.  
 CN for open frame, no fan, with 12V / 0.25A fan supply.  
 d = M for molex input connector or equivalent, J for JST connector or equivalent.  
 e = D for dual fused input or L for single fuse in the live line  
 f = S for standard leakage, L for low leakage, R for reduced leakage, T for tiny leakage.\*  
 g = Y for Oring FET included or N for nothing.  
 h = E for enable, T for inhibit, N for no inhibit, no enable.  
 i = Nothing for horizontal output connector, -V for vertical output connector, -S for screw terminal  
 j = Nothing for standard channel 1 output voltage, -xD or -xPD where D is for units with programmed negative load regulation, PD is for units with programmed positive load regulation, x is the voltage of the regulation in 100mVolts and is within the Output Adjustment range (example, 7D = 0.7V of negative load regulation, 24PD = 2.4V of positive load regulation).  
 k = Nothing or -x where x is three numbers from 0 to 9 which denotes various output voltage/current settings within the specified ranges of each output for a particular unit or blank for standard output settings. (may define non-safety related parameters/feature, e.g. reduced primary current limit, reduced OVP)

\*At 440Hz, leakage current is > 3.5mA and therefore must be assessed in the end use application. L < 300uA leakage, R < 150uA leakage and T < 75uA leakage Output parameters:

O/P Channel	Vout nom.	Range (V)	O/P Current (A)	Max O/P Power (W)
CH1	12	11.4 - 13.2*	25	300 (400**)
	24	22.8 - 26.4*	12.5	300 (400**)
	28	27 - 32*	10.72	300 (400**)
	40	36 - 42*	7.5	300 (350***)
	48	47 - 50*	6.25	300 (350***)
	50	50.1 - 54*	6.0	300 (350***)
Standby	5	Fixed	2	10
	12	12-13.5*	1	13.5
Fan output	12	Fixed	0.25	3
	12	Fixed	1	12

\* Can be adjusted from nominal at the factory only.

\*\* Peak power of 400W for 10 seconds maximum, maximum rms power of 300W:

\*\*\* Peak power of 350W for 10 seconds maximum, in any 1 minute cycle, maximum rms power of 300W:

where T1 = peak power time on

and T2 = reduced power time on

Maximum continuous power output 300W (excluding fan output)



## Output Limitations

All standard outputs are SELV up to and including 48V nominal. Voltages above 48V nominal are non SELV and must not be accessible to an end operator..

All outputs have basic spacings to earth, and due consideration must be given to this in the end product design, except for Y50029# (60950-1 approved model) which has functional spacings to earth.

Non Standard models.

Model: Y5J008# (where # can be any letter) or EFE300MJ-12.1-5-008 or EFE300MJ-12.1-5-008-SGP  
Maximum outputs: 12.1V, 21.49A, plus 5V, 2A standby.

Maximum ambient: As standard model. Orientations: As standard model.

Comments: Fan speed is controlled at 6600rpm up to and between 45 to 50 degrees C ambient after which the fan resumes its normal nominal voltage rating. Can be fitted with or without fan guard. Model may also include a without fan and open frame type.

Model: Y5J006# (where # can be any letter) or EFE300MJ-12-5-006. Maximum outputs: 11.4V to 13.2V\*, 25A, (300W max) plus 5V, 2A standby. Maximum ambient: As standard model.

Orientations: As standard model.

Comments: Longer version than standard model to accommodate additional reservoir capacitor for a greater hold up time.

## Additional Information

This report is a reissue of CBTR Ref. No: E331788-A16-CB2 dated 2015-10-20 and CB certificate DK-49192-UL dated 2015-10-20. Based on the previously conducted testing, limited testing for this report and the review of product technical documentation including photos, schematics, wiring diagrams and similar, it has been determined that the product complies with the standard.

The original report has been modified for the following:

1. Modification of base PWBs to accommodate 2x additional discharge resistors with relevant testing to show continued compliance.
2. Updates to the CCL.
3. Updates to the enclosures.

## Technical Considerations

- The product was investigated to the following standards:

### Main Standard(s):

IEC 61010-1:2010 (Third Edition)

### From Country Differences:

- USA / Canada: UL 61010-1, 3rd Edition, 2012-05-11 / CAN/CSA-C22.2 No. 61010-1, 3rd Edition, 2012-05
- Switzerland: SN EN 61010-1:2010
- Japan: -
- Austria: EN 61010-1:2010
- Denmark: DS/EN 61010-1:2010
- Korea, Republic Of: K 61010-1
- Slovenia: SIST EN 61010-1
- Sweden: SS-EN 61010-1:2010
- United Kingdom: BS EN61010-1:2010

Additional Standards:

EN 61010-1:2010

- The following additional investigations were conducted: N/A
- The product was not investigated to the following standards or clauses: N/A
- The following accessories were investigated for use with the product: N/A
- Equipment class: Class I

Equipment type: For building in

The product was submitted and tested for use at the maximum recommended ambient temperature (Tmra) of 50°C maximum load, 70°C reduced load.

**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 enclosure does not serve as a fire/electrical/mechanical enclosure
  - The need for the following shall be considered in the end-product: Bonding to protective earthing terminal (Class I construction)
  - The output connectors are: Not investigated for field wiring
  - Creepage and clearance distances were based on a maximum working voltage of: Primary to earth dead metal: 668Vpeak, 348Vrms., Primary to secondary: 880Vpeak, 408Vrms.
  - 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: Dielectric Strength test in accordance with the handbook., Temperature test for customer air models.,
  - 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 maximum load, 70°C reduced load.
  - End-product temperature tests for power supplies shall consider that the following transformers employ the indicated insulation system: Transformer Tx1, Class F (155°C)., Transformer Tx2, Class F (155°C).
  - End-product dielectric strength tests shall be based on the maximum working voltage of: Primary to earth dead metal: 668Vpeak, 348Vrms., Primary to secondary: 880Vpeak, 408Vrms.
  - The leakage current tests have been provided for information only. This test must be considered in the end product application and must be repeated for frequencies above 63Hz. --
  - This product has been assessed for a maximum altitude of 5000m
  - The risk associated with clause 5.4.5 shall be assessed in the end product.
  - Multi-layer PWBs accepted under CBTR Ref. No: E349607-A23 dated 2014-07-31 and letter report in Enclosure 8-03 of this report.
- Description of special features.  
(HV circuits, high pressure systems etc.)

**Report Modifications**

Date Modified (Year-Month-Day)	Modifications Made (include Report Reference Number)	Modified By

2019-09-20	<p>This report is reissued based on CBTR Ref. No: E331788-A16-CB-2 dated 2015-10-20 and CB certificate DK- 49192-UL dated 2015-10-20. Based on the previously conducted testing, limited testing for this report and the review of product technical documentation including photos, schematics, wiring diagrams and similar, it has been determined that the product complies with the standard.</p> <p>The original report has been modified for the following:</p> <ol style="list-style-type: none"><li>1. Modification of base PWBs to accommodate 2x additional discharge resistors with relevant testing to show continued compliance.</li><li>2. Updates to the CCL.</li><li>3. Updates to the enclosures.</li></ol>	Hedieh Naderi