Test Report issued under the responsibility of:

TEST REPORT

IEC 60950-1
Information technology equipment – Safety – Part 1: General requirements

Report Number. .....:	**T223-0127/16**
Date of issue .....:	**2016-02-26**
Total number of pages.....	**387 pages**
Applicant's name.....:	**TDK-Lambda UK Ltd.**
Address .....:	**Kingsley Avenue Ilfracombe, Devon EX34 8ES, United Kingdom**
Test specification:	
Standard .....:	IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013
Test procedure.....:	CB Scheme
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC60950_1F
Test Report Form(s) Originator.....:	SGS Fimko Ltd
Master TRF .....:	Dated 2014-02

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.

Test item description……..:	Switching power supply for building-in
Trade Mark……..:	TDK·Lambda
Manufacturer……..:	ARCH Electronics Corp. 7TH FL-1, No. 79, Sec. 1, Hsin Tai Wu Rd., Hsin Chin, New Taipei TW-221, Taiwan
Model/Type reference……..:	KMS15A-xx/yy-zzz, where: ‘‘xx’’ can be 3,75 ~ 5,25; 6,75 ~ 9,45; 9 ~ 12,6; 11,25 ~ 15,75 or 18 ~ 25,2 ‘‘yy’’ can be /blank or SC = Screw terminal chassis mount or SD = Screw terminal DIN rail mount “zzz” can be alphanumeric and does not have affect on safety KMS30A-xx/yy-zzz, where: ‘‘xx’’ can be 3,75 ~ 5,25; 9,0 ~ 12,6; 11,25 ~ 15,75 or 18,0 ~ 25,2 ‘‘yy’’ can be /blank or SC = Screw terminal chassis mount or SD = Screw terminal DIN rail mount “zzz” can be alphanumeric and does not have affect on safety KMS60A-xx/yy-zzz, where: ‘‘xx’’ can be 3,75 ~ 5,25; 6,75 ~ 9,45; 9 ~ 12,6; 11,25 ~ 15,75 or 18 ~ 25,2 ‘‘yy’’ can be /blank or SC = Screw terminal chassis mount or SD = Screw terminal DIN rail mount “zzz” can be alphanumeric and does not have affect on safety

Ratings……:	Input: KMS15A-xx/yy-zzz; 100-240 Vac; 47-63 Hz; 0,385 Amax KMS30A-xx/yy-zzz; 100-240 Vac; 47-63 Hz; 0,65 Amax KMS60A-xx/yy-zzz; 100-240 Vac; 47-63 Hz; 1,5 Amax Output: KMS15A-xx/yy-zzz Where ‘‘xx’’ can be 3,75 ~ 5,25: 3,75 ~ 5,25 Vdc; 3 Amax.; Max. 15 W Where ‘‘xx’’ can be 6,75 ~ 9,45: 6,75 ~ 9,45 Vdc; 1,666 Amax.; Max.15 W Where ‘‘xx’’ can be 9,0 ~ 12,6: 9,0 ~ 12,6 Vdc; 1,25 Amax.; Max. 15 W Where ‘‘xx’’ can be 11,25 ~ 15,75: 11,25 ~ 15,75 Vdc; 1Amax.; Max.15 W Where ‘‘xx’’ can be 18,0 ~ 25,2: 18,0 ~ 25,2 Vdc; 0,625 Amax.; Max.15 W KMS30A-xx/yy-zzz Where ‘‘xx’’ can be 3,75 ~ 5,25: 3,75 ~ 5,25 Vdc; 5 Amax.; Max. 25 W Where ‘‘xx’’ can be 9,0 ~ 12,6: 9 ~ 12,6 Vdc; 2,5 Amax.; Max. 30 W Where ‘‘xx’’ can be 11,25 ~ 15,75: 11,25 ~ 15,75 Vdc; 2Amax.; Max.30 W Where ‘‘xx’’ can be 18,0 ~ 25,2: 18,0 ~ 25,2 Vdc; 1,25 Amax.; Max. 30 W KMS60A-xx/yy-zzz Where ‘‘xx’’ can be 3,75 ~ 5,25: 3,75 ~ 5,25 Vdc; 10 Amax.; Max. 51 W Where ‘‘xx’’ can be 6,75 ~ 9,45: 6,75 ~ 9,45 Vdc; 6,666 Amax.; Max.60 W Where ‘‘xx’’ can be 9,0 ~ 12,6: 9,0 ~ 12,6 Vdc; 5 Amax.; Max. 60 W Where ‘‘x’’ can be 11,25 ~ 15,75: 11,25 ~ 15,75 Vdc; 4 Amax.; Max. 60 W Where ‘‘x’’ can be 18,0 ~ 25,2: 18,0 ~ 25,2 Vdc; 2,5 Amax.; Max. 60 W

Testing procedure and testing location:			
☒	**CB Testing Laboratory:**	SIQ Ljubljana Testing Laboratory is accredited by Slovenian Accreditation, Reg. No.: LP-009	
Testing location/ address .....:		Tržaška c. 2, SI-1000 Ljubljana Slovenia	
☐	**Associated CB Testing Laboratory:**		
Testing location/ address .....:			
Tested by (name + signature).....:		Janez Vidmar	
Approved by (name + signature).....:		Gregor Schoss	
☐	**Testing procedure: TMP/CTF Stage 1:**		
Testing location/ address .....:			
Tested by (name + signature).....:			
Approved by (name + signature).....:			
☐	**Testing procedure: WMT/CTF Stage 2:**		
Testing location/ address .....:			
Tested by (name + signature).....:			
Witnessed by (name + signature) .....:			
Approved by (name + signature).....:			
☐	**Testing procedure: SMT/CTF Stage 3 or 4:**		
Testing location/ address .....:			
Tested by (name + signature).....:			
Witnessed by (name + signature) .....:			
Approved by (name + signature).....:			
Supervised by (name + signature).....:			

List of Attachments:

1. Test Report (229 pages)
2. National Differences – Enclosure No. 1 (41 pages)
3. European Group Differences and National Differences according to EN 60950-1:2006 + A1:2010 + A2:2013 + A11:2009 + A12:2011 – Enclosure No. 1a (21 pages)
4. Pictures – Enclosure No. 2 (19 pages)
5. Schematics, Layouts, Transformer data - Enclosure No. 3 (77 pages)

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
1.6.2 Input Test **1.7.11 Durability** **2.1.1.5 Energy Hazard Measurements** **2.1.1.7 Discharge of capacitors in the primary circuits** **2.2.2 SELV: Hazard Voltage (Circuit) Measurement Test** **2.2.3 SELV Reliability testing** **2.4 Limited current circuit** **2.9.2 Humidity Test** **2.10.2 Working Voltage measurement on PCB and Transformer** **2.10.3/2.10.4 Clearance and Creepage distance measurement** **2.10.5 Distance Through Insulation measurement** **4.2.2-4.2.4 Steady force test, 10N and 250 N** **4.2.5 Impact test** **4.2.7 Stress relief test; heat test** **4.5.2 Heating (Temperature) Test** **4.5.5 Resistance to abnormal heat (Ball pressure test)** **5.1 Touch current measurements** **5.2 Electric Strength Test** **5.3 Abnormal Operating Tests foreseeable misuse:** **SELV reliability and failure in the voltage regulation, Functional insulation, Component faults, Overload and short and no load at the outputs, Voltage Mismatch,** **Special tests: /**	**SIQ Ljubljana, Tržaška c. 2, SI-1000 Ljubljana, Slovenia**

Summary of compliance with National Differences

List of countries addressed:

Argentina**, Australia, Austria***, Bahrain**, Belarus**, Belgium***, Brazil**, Bulgaria***, Canada, China, Cyprus***, Colombia**, Croatia**, Czech Republic***, Denmark***, Finland***, France***, Germany***, Greece***, Hungary***, India**, Indonesia**, Iran**, Ireland***, Israel, Italy***, Japan*, Kazakhstan**, Kenya**, Korea, Lybia**, Malaysia**, Mexico**, Netherlands***, New Zealand*, Norway***, Pakistan**, Poland***, Portugal***, Romania***, Russian Federation**, Saudi Arabia**, Serbia**, Singapore**, Slovakia***, Slovenia***, South Africa**, Spain***, Sweden, Switzerland, Thailand**, Turkey***, Ukraine**, United Arab Emirates**, United Kingdom, Uruguay**, USA, Vietnam**

* No national differences to IEC 60950-1:2005 (2nd edition) (+ A1 + A2) declared

** No national differences to IEC 60950-1:2005 (2nd edition) + A1 + A2 or IEC 60950-1:2001 (1st edition) declared

*** EU group differences

☒ **The product fulfils the requirements of EN 60950-1:2006 + A1:2010 + A2:2013 + A11:2009 + A12:2011 (see Enclosure No. 1a).**

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.

1) KMS15A-xx/yy-zzz

1) KMS30A-xx/yy-zzz

1) KMS60A-xx/yy-zzz

Test item particulars.....:	
Equipment mobility.....:	[] movable [] hand-held [] transportable [] stationary [x] for building-in [] direct plug-in
Connection to the mains.....:	[] pluggable equipment [] type A [] type B [] permanent connection [] detachable power supply cord [] non-detachable power supply cord [x] not directly connected to the mains
Operating condition.....:	[x] continuous [] rated operating / resting time:
Access location .....:	[] operator accessible [x] restricted access location
Over voltage category (OVC) .....:	[] OVC I [x] OVC II [] OVC III [] OVC IV [] other:
Mains supply tolerance (%) or absolute mains supply values .....:	90 – 264 Vac
Tested for IT power systems .....:	[] Yes [x] No
IT testing, phase-phase voltage (V) .....:	
Class of equipment .....:	[] Class I [] Class II [] Class III [x] Not classified
Considered current rating of protective device as part of the building installation (A) .....:	Max. 2
Pollution degree (PD) .....:	[] PD 1 [x] PD 2 [] PD 3
IP protection class .....:	IPX0
Altitude during operation (m) .....:	5000
Altitude of test laboratory (m) .....:	300
Mass of equipment (kg) .....:	KMS15A-xx/yy-zzz: 0,059 KMS30A-xx/yy-zzz: 0,130 KMS60A-xx/yy-zzz: 0,280

Possible test case verdicts:	
- 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)
Testing.....:	
Date of receipt of test item.....:	2015-03-24, 2015-04-01, 2015-04-17 2016-02-19 (Rev. 1.0)
Date(s) of performance of tests .....:	From 2015-03-30 to 2015-07-01 From 2016-02-23 to 2016-02-23 (Rev. 1.0)

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ 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**

☒ **Not applicable**

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

Name and address of factory (ies) ..... : ARCH Electronics Corp.

7TH FL-1, No. 79, Sec. 1, Hsin Tai Wu Rd., Hsin Chin, New Taipei TW-221, Taiwan

General product information:

EUT is power supply unit intended for building-in provided with a single power output and with universal input range 100-240 Vac.

Power supply unit is provided with plastic enclosure and additionally filled with non-conductive insulation compound to increase rigidity of the power supply unit. Clearance and creepage distances not rely on insulation compounds; therefore thermal cycling not performed.

Power supply unit is provided with input and output pins intended for soldering to the PCB within end product (KMS15A-xx, KMS30A-xx, KMS60A-xx) or with screw terminals for input/output wires connection (KMS15A-xx/SC, KMS15A-xx/SD, KMS30A-xx/SC, KMS30A-xx/SD, KMS60A-xx/SC, KMS60A-xx/SD).

In model designation KMS15A-xx/yy-zzz:
"xx" can be 3,75 ~ 5,25; 6,75~9,45; 9 ~ 12,6; 11,25~15,75 or 18~25,2 and denotes DC output voltage
"yy" can be /blank or SC = Screw terminal chassis mount or SD = Screw terminal DIN rail mount
"zzz" can be alphanumeric and does not have affect on safety

In model designation KMS30A-xx/yy-zzz:
"xx" can be 3,75 ~ 5,25; 9,0 ~ 12,6; 11,25 ~ 15,75 or 18,0 ~ 25,2 and denotes DC output voltage
"yy" can be /blank or SC = Screw terminal chassis mount or SD = Screw terminal DIN rail mount
"zzz" can be alphanumeric and does not have affect on safety

In model designation KMS60A-xx/yy-zzz:
"xx" can be 3,75 ~ 5,25; 6,75~9,45; 9~12,6; 11,25 ~ 15,75 or 18~25,2 and denotes DC output voltage
"yy" can be /blank or SC = Screw terminal chassis mount or SD = Screw terminal DIN rail mount
"zzz" can be alphanumeric and does not have affect on safety

For output rating of each model, see table on page 2 for details.

KMS15A-xx/yy-zzz: PCB with dimension 50,1 mm by 25,0 mm is used.

Additional PCB for KMS15A-xx/yy-zzz (yy can be SC or SD): 92,5 mm by 50,5 mm is used.

KMS30A-xx/yy-zzz: PCB with dimension 60 mm by 41,5 mm is used.

Additional PCB for KMS30A-xx/yy-zzz (yy can be SC or SD): 92,5 mm by 50,5 mm is used.

KMS60A-xx/yy-zzz: PCB with dimension 85 mm by 60 mm is used.

All the transformers have similar construction, transformer construction details of model KMS15A-xx/yy-zzz, KMS30A-xx/yy-zzz and KMS60A-xx/yy-zzz are specified in Enclosure No. 3

Explanation of the test program:

The component was tested according to the standard IEC 60950-1:2005 (2nd Edition) + A1:2009 + A2:2013 and/or EN 60950-1:2006 + A1:2010 + A2:2013 + A11:2009 + A12:2011.

Additionally the component was also evaluated according to the standards CSA C22.2 No. 60950-1:2007 + A1:2011 + A2:2014 and UL60950-1:2007 (2nd Edition) + A1:2011 + A2:2014 and fulfils the requirements of these standards.

The power supply tested in this test report is only component level power supply. Power supply unit is intended for building-in.

Essential performance shall be determined within the end equipment.

The power supply unit is intended for building-in and provided with plastic enclosure (filled with insulation compound to improve rigidity of the enclosure). Enclosure is considered as part that cannot be touched by the operator when installed within the end product.

The unit provides internally one primary fuse. Primary fuse not accessible due the power supply unit is additionally filed with insulation compound. Additionally for models KMS15A-xx/SC-zzz, KMS15A-xx/SD-zzz, KMS30A-xx/SC-zzz, KMS30A-xx/SD-zzz, KMS60A-xx/SC-zzz, KMS60A-xx/SD-zzz external fuse is provided.

Secondary output circuit is separated from mains by reinforced insulation and rated SELV. The output does not provide hazard energy level.

Power supply is provided with electrical specifications.

The power supply is rated as class II construction (provided in fully plastic enclosure).

The transformers T1 provide reinforced insulation. These transformers are built up to fulfil the requirement of insulation class B.

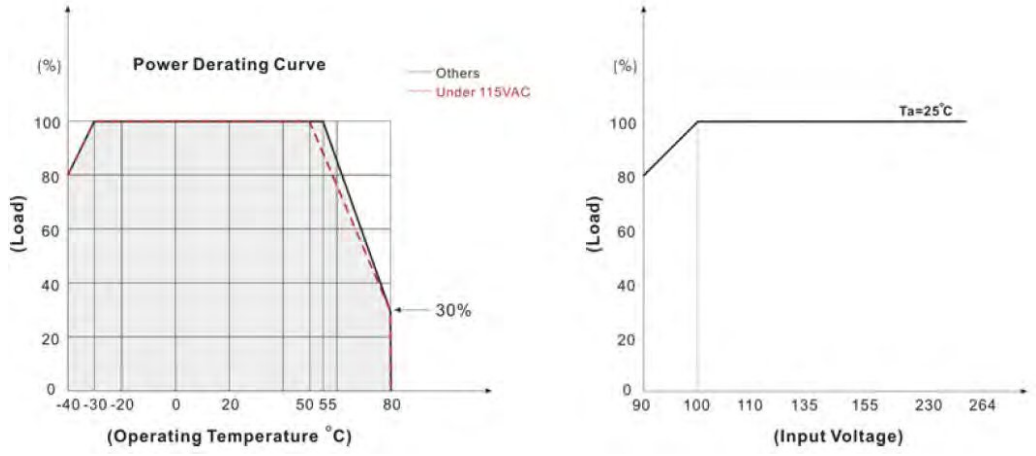
The equipment has been evaluated for use in a Pollution Degree 2 and overvoltage category II environment and a maximum altitude of 5000 m.

Multiplication factor 1,48 used for required clearance distance between primary and secondary.

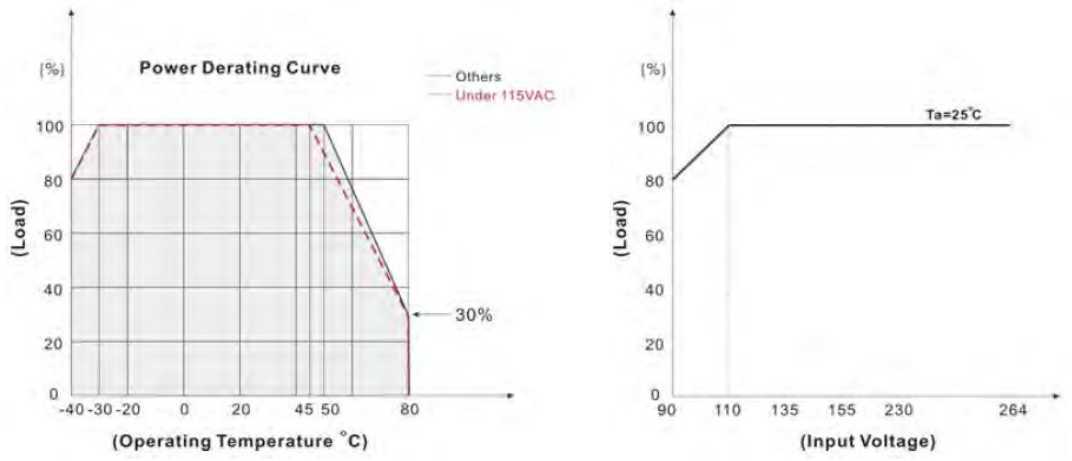
Power supply unit is provided with plastic enclosure made by non-flammable material V-0.

The power supply is maintenance free.

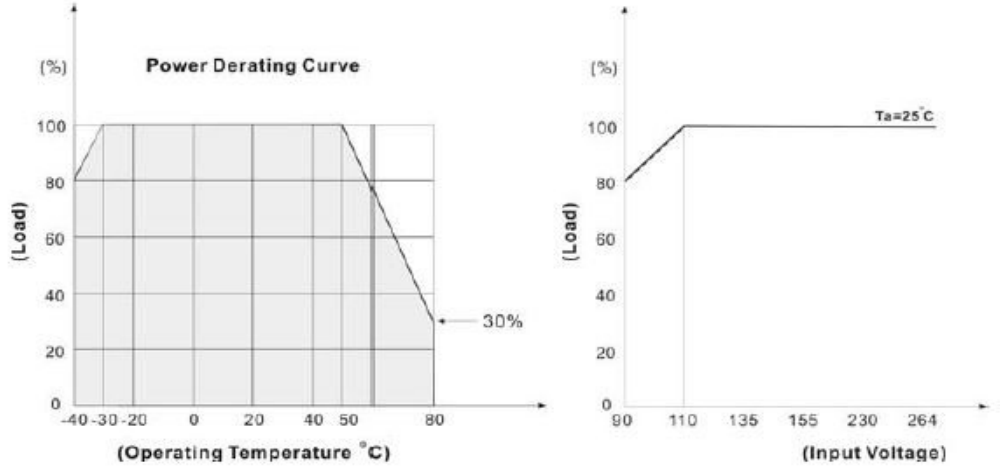
The power supplies KMS15A –xx/yy-zzz are intended for operating at ambient temperature up to 50°C (without derating) or up to 80°C (with derating). Additional derating at input voltage below 115Vac. See charts below.



The power supplies KMS30A-xx/yy-zzz are intended for operating at ambient temperature up to 50°C (without derating) or up to 80°C (with derating). Additional derating at input voltage below 115Vac. See chart below.



The power supplies KMS60A-xx/yy-zzz are intended for operating at ambient temperature up to 50°C (without derating) or up to 80°C (with derating):



The unit shall not be used for use in an oxygen rich environment.

The unit it is not intended to be use with flammable anesthetics and not intended for use in conjunction with flammable agents.

Information for Production testing to be done by the manufacturer: /

History Sheet

Date	Report Number	Change	Revision No.
2015-10-06	T223-0312/15	Initial Test Report issued.	—
2016-02-26	T223-0127/16	Test report reviewed and updated due to new printing method of the label on plastic enclosure. After review the following test was considered necessary: - Clause 1.7.11: Durability No other changes.	1.0

Factory Tests:

The equipment at the conclusion of manufacture, before shipment, is subject to the following production line testing:

(Warning: The factory test(s) specified may present a hazard of injury to personnel and/or property and should only be performed by persons knowledgeable of such hazards and under conditions designed to minimize the possibility of injury.)

Production-line Dielectric Voltage-Withstand Test (Cl 5.2): The equipment at the conclusion of manufacture, before shipment, shall withstand for one sec, without breakdown, the application of 1500 Vac or 2121 Vdc between live parts and exposed non-current-carrying metal parts.
Additional information for the follow up engineer:

Additional information for the follow up engineer: /

Abbreviations used in the report:

- normal conditions	**N.C**.	- single fault conditions	**S.F.C**
- functional insulation	**OP**	- basic insulation	**BI**
- double insulation	**DI**	- supplementary insulation	**SI**
- between parts of opposite polarity	**BOP**	- reinforced insulation	**RI**

Indicate used abbreviations (if any)