Test Report issued under the responsibility of:

TEST REPORT

IEC 60950-1: 2005 (2nd Edition) and/or EN 60950-1:2006
Information technology equipment – Safety –
Part 1: General requirements

Report Reference No.....:	T223-0335/11
Date of issue.....:	2011-11-14
Total number of pages	226 pages
CB/CCA Testing Laboratory.....:	SIQ – Slovenian Institute of Quality and Metrology Testing Laboratory is accredited by Slovenian Accreditation, Reg. No.: LP-009
Address .....:	Tržaška cesta 2, 1000 Ljubljana, Slovenia
Applicant's name.....:	Arch Electronics Corp.
Address .....:	3F., No. 79, Sec. 1, Hsin Tai Wu Rd., Sijhih City, Taipei County 221, Taiwan
Manufacturer's name .....:	Arch Electronics Corp.
Address .....:	3F., No. 79, Sec. 1, Hsin Tai Wu Rd., Sijhih City, Taipei County 221, Taiwan
Factory's name .....:	Arch Electronics Corp.
Address .....:	3F., No. 79, Sec. 1, Hsin Tai Wu Rd., Sijhih City, Taipei County 221, Taiwan
Test specification:	
Standard.....:	IEC 60950-1:2005 (Second Edition), Am 1: 2009 EN 60950-1:2006 + Am 1:2010 + Am 11:2009 + Am 12:2011
Test procedure .....:	CB
Non-standard test method……..:	N/A
Test Report Form No.....:	**IEC60950_1B**
Test Report Form(s) Originator .....:	SGS Fimko Ltd
Master TRF .....:	Dated 2010-04

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.

Test item description .....:	Switching Power Supply for building-in
Trade Mark .....:	TDK·Lambda

Model/Type reference ..... : KMx40-y

"x" can be S, D or T

S= Single output

D= Dual output

T= Triple output

"y" can be 3P3, 5, 9, 12, 15, 24, 55, 1212, 1515, 512, 524, 51212 or 51515

Ratings ..... : I/P: 100-240 Vac; 47-63 Hz; 0,8-0,4 A

O/P:

Model Name	**Output Ratings (output dc voltage / output current)**
KMS40-3P3	3,3 V / 8 A
KMS40-5	5 V / 8 A
KMS40-9	9 V / 4,444 A
KMS40-12	12 V / 3,333 A
KMS40-15	15 V / 2,666 A
KMS40-24	24 V / 1,667 A
KMD40-55	+5 V / 4 A, -5 V / 4 A
KMD40-1212	+12 V / 1,666 A, -12 V / 1,666 A
KMD40-1515	+15 V / 1,333 A, -15 V / 1,333 A
KMD40-512	+5 V / 5 A, +12 V / 1,25 A
KMD40-524	+5 V / 5 A, +24 V / 0,625 A
KMT40-51212	+5 V / 5 A, +12 V / 0,6 A, -12 V / 0,6 A
KMT40-51515	+5 V / 5 A, +15 V / 0,5 A, -15 V / 0,5 A

Testing procedure and testing location:	
☒ **CB/CCA Testing Laboratory:**	SIQ – Slovenian Institute of Quality and Metrology
Testing location/ address ..... :	Tržaška cesta 2, 1000 Ljubljana, Slovenia
☐ **Associated CB Laboratory:**	
Testing location/ address ..... :	
Tested by (name + signature) ..... :	Janez Vidmar
Approved by (+ signature) ..... :	Boštjan Glavič
☐ Testing procedure: TMP	
Tested by (name + signature) ..... :	
Approved by (+ signature) ..... :	
Testing location/ address ..... :	
☐ Testing procedure: WMT	
Tested by (name + signature) ..... :	
Witnessed by (+ signature)..... :	
Approved by (+ signature) ..... :	
Testing location/ address ..... :	
☐ Testing procedure: SMT	
Tested by (name + signature) ..... :	
Approved by (+ signature) ..... :	
Supervised by (+ signature)..... :	
Testing location/ address ..... :	
☐ Testing procedure: RMT	
Tested by (name + signature) ..... :	
Approved by (+ signature) ..... :	
Supervised by (+ signature)..... :	
Testing location/ address ..... :	

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

1. Test Report
2. National Differences – Enclosure No. 1
3. European Group Differences and National Differences according to EN 60950-1:2006 + A11:2009 + A12:2011 – Enclosure No. 1a
4. Pictures – Enclosure No. 2
5. Schematics, Layouts, Transformer data - Enclosure No. 3

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
See next page	**SIQ**

Summary of compliance with National Differences:

Argentina**, Australia*, Austria**, Belarus**, Belgium**, Brazil**, Bulgaria**, Canada, China*, Croatia**, Czech Republic**, Denmark, Finland, France**, Germany, Greece**, Hungary**, India**, Indonesia**, Ireland, Israel**, Italy**, Japan*, Kenya**, Korea, Malaysia**, Mexico**, Netherlands**, New Zealand*, Norway, 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

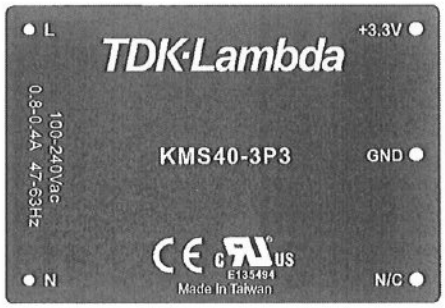
* No national differences to IEC 60950-1:2005 (2nd edition) declared

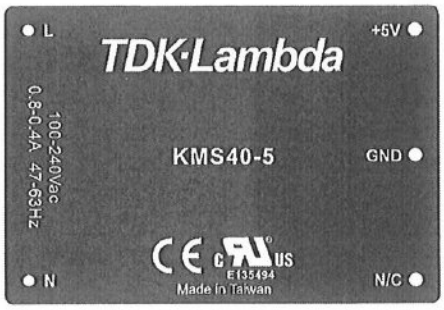
** No national differences to IEC 60950-1:2005 (2nd edition) or IEC 60950-1:2001 (1st edition) declared

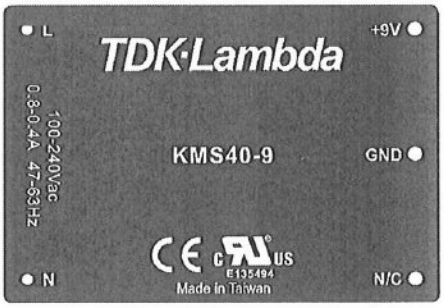
Copy of marking plate

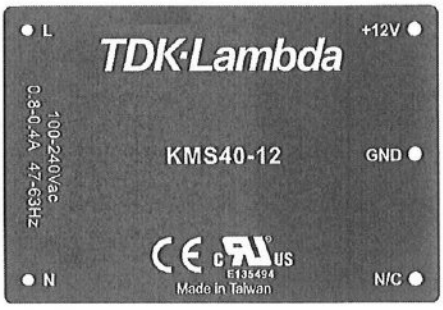
The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

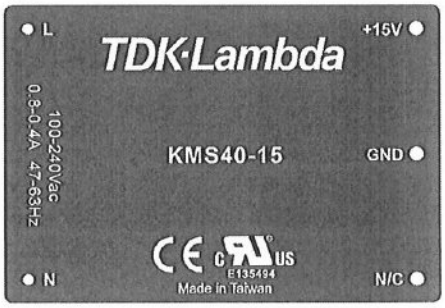
(Additional requirements for markings. See 1.7 NOTE)

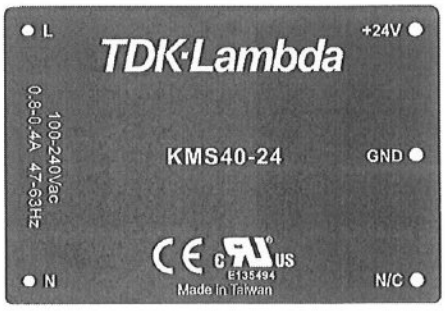


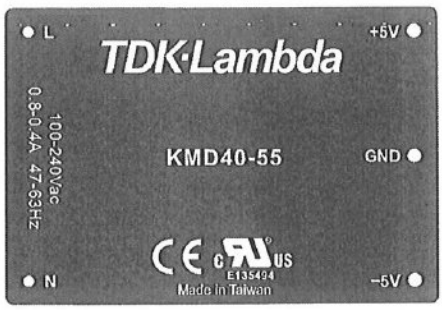


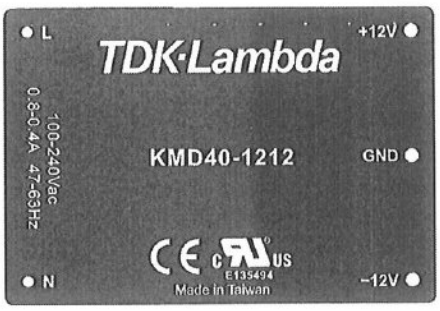


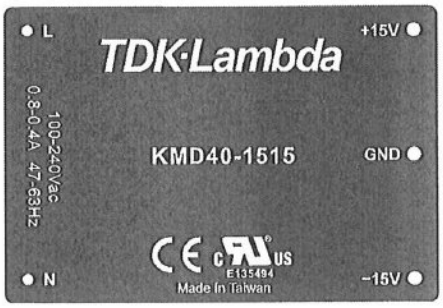




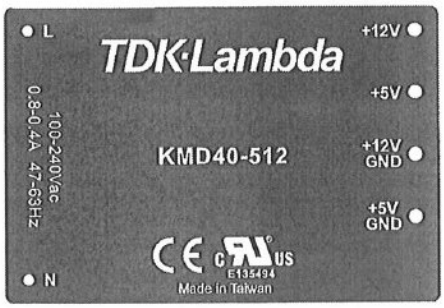



L
+5V
TDK·Lambda
KMD40-55
GND
100-240Vac
0.8-0.4A 47-63Hz
E135494
Made in Taiwan
N
-5V


L
+12V
TDK·Lambda
KMD40-1212
GND
100-240Vac
0.8-0.4A 47-63Hz
E135494
Made in Taiwan
N
-12V


L
+15V
TDK·Lambda
KMD40-1515
GND
100-240Vac
0.8-0.4A 47-63Hz
E135494
Made in Taiwan
N
-15V


L
+24V
TDK·Lambda
+5V
KMD40-524
+24V
GND
100-240Vac
0.8-0.4A 47-63Hz
+5V
GND
E135494
Made in Taiwan
N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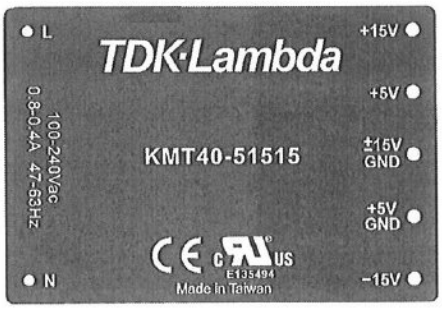
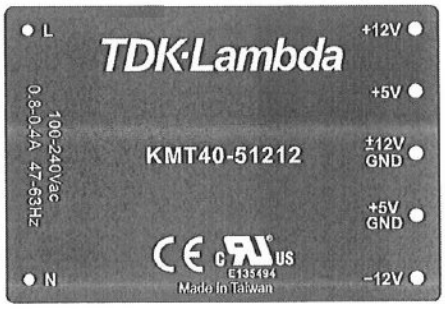
TDK·Lambda
+5V
KMD40-512
+12V
GND
100-240Vac
0.8-0.4A 47-63Hz
+5V
GND
E135494
Made in Taiwan
N


L
+15V
TDK·Lambda
+5V
KMT40-51515
±15V
GND
100-240Vac
0.8-0.4A 47-63Hz
+5V
GND
E135494
Made in Taiwan
N
-15V


L
+12V
TDK·Lambda
+5V
KMT40-51212
±12V
GND
100-240Vac
0.8-0.4A 47-63Hz
+5V
GND
E135494
Made in Taiwan
N
-12V

Overview of the testing done (P = Test passed, N/A test not applicable)		
Clause	Test	Test Conducted
1.6.2	Input Test	P
1.7.11	Durability	P
2.1.1.5	Energy Hazard Measurements	P
2.1.1.7	Capacitance Discharge Test	P
2.1.1.8	Energy hazards – d.c. mains supplies	N/A
2.2.2	SELV: Hazard Voltage (Circuit) Measurement Test	P
2.2.3	SELV Reliability testing	P
2.4	Limited Current Circuit (Bridging components)	P
2.5	Limited Power Source	N/A
2.6	Earthing Test, earth trace test (UL PAG)	N/A
2.9.2	Humidity Test	P
2.10.2	Working Voltage measurement on PCB and Transformer	P
2.10.3/2.10.4	Clearance and Creepage distance measurement	P
2.10.5	Distance Through Insulation measurement	P
2.10.5.6	Thin Sheet Material (barriers)	P
2.10.12	Enclosed and Sealed parts	N/A
4.2.2-4.2.4	Steady force test, 10N, 30 N, 250 N	P
4.2.5	Impact test, Fall test, Swing test	N/A
4.2.6	Drop test	N/A
4.2.7	Stress relief test; heat test (℃/7 h)	P
4.2.10	Wall or ceiling mounted equipment	N/A
4.3.2	Handle Test (with USA Deviation)	N/A
4.3.6	Torque Test for direct plug in Products. Dimensions of the plugs	N/A
4.5.2	Heating (Temperature) Test	P
4.5.5	Resistance to abnormal heat (Ball pressure test)	P
5.1	Touch Current and protective conductor current	P
5.2	Electric Strength Test	P
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 , Air holes closed, Fan blocked, Voltage Mismatch, battery back feed test	P
	Hot swap test	N/A
	Insulation resistance Test	N/A

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 [] restricted access location [X] service access area (for building-in)
Over voltage category (OVC) .....:	[] OVC I [X] OVC II [] OVC III [] OVC IV [] other:
Mains supply tolerance (%) or absolute mains supply values .....:	± 10% (90-264 Vac)
Tested for IT power systems .....:	[] Yes [X] No
IT testing, phase-phase voltage (V) .....:	N/A
Class of equipment .....:	[] Class I [] Class II [] Class III [X] Not classified (Class II construction for building-in)
Considered current rating (A) .....:	16 A
Pollution degree (PD) .....:	[] PD 1 [X] PD 2 [] PD 3
IP protection class .....:	IP20
Altitude during operation (m) .....:	Up to 5000 m
Altitude of test laboratory (m) .....:	300 m
Mass of equipment (kg) .....:	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..... :	2010-05-18
	2011-08-09 (Revision No.: 1.0)
Date(s) of performance of tests..... :	2010-05-18 to 2010-06-09
	2011-08-09 to 2011-10-21 (Revision No.: 1.0)

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 testing laboratory. "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. **Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.** Throughout this report a ☒ comma / ☐ point is used as the decimal separator.
Manufacturer's Declaration per sub-clause 6.2.5 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. 3F., No. 79, Sec. 1, Hsin Tai Wu Rd., Sijhih City, Taipei County 221, Taiwan

History sheet

Date	Report No.	Change	Revision
2010-06-16	T223-0195/10	Initial Test Report issued.	--
2011-11-14	T223-0335/11	Some modification of the product (two bridging capacitors C18 and C2 in series connected between primary and secondary circuit instead of single capacitor C18). 2 x 1500 pF (connected in series) instead of 1 x 1000 pF The unit was additionally evaluated for use up to 5000 meters altitude. After review, the following tests were considered necessary: - Touch current measurements - Limited current circuit measurements - Update list of critical components - Clearance and creepage distance measurements	1.0

General product information:

Information about the Product:

The power supply is a switch mode power supply unit intended for building-in.

The equipment, models: KMx40-y is switching type power supply for building into the information technology equipment.

In model designation, x can be S, D or T (S= Single output, D= Dual output, T= Triple output); y can be 3P3, 5, 9, 12, 15, 24, 55, 1212, 1515, 512, 524, 51212 or 51515, which is used to indicate different output. For output rating of each model, see table on page 2 for details.

The equipment, models: KMx40-y is with plastic case and filled with non-conductive compound.

PCB with dimension 85 mm by 60 mm is used. There are totally 3 different layout of main PCB:

- MSC-S (Single output)
- MSC-D (Dual output)
- MSC-T (Triple output)

Circuit design in primary circuit of all models is identical. Circuit design in secondary circuit of all models is similar except for different design and sets of regulation circuits for multiple outputs.

All the transformers have similar separation construction, transformer construction details of model KMx40-y is specified in Enclosure No. 3.

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)

Summary of testing:

1) PSU was tested according to the standard IEC 60950-1:2005 (2nd Edition) and/or EN 60950-1:2006.

2) The product was submitted and tested for use at the maximum ambient temperature (Tma) permitted by the manufacturers specification of: 50 degree C.

3) Safety Instructions: Built in product, safety instructions provided by the manufacturer.

4) The test samples are pre-production with serial number.

5) Switch mode transformer provides reinforced insulation between primary and secondary side. Primary and secondary windings are triple insulated and made by FURUKAWA or TOTOKU. There is also reinforced insulation between primary parts and secondary parts within the equipment.

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

7) The unit complies with the requirements of Class II construction (Reinforced insulation between primary and secondary provided within the equipment).

8) Insulation foil between bridging capacitors C18 and C2 and transformer core provided. See enclosed pictures of the unit for details.

8) A suitable Electrical and Fire enclosure shall be provided in the end equipment.

9) The output of power supply does not comply with the requirements for limited power sources sub-clause 2.5.

10) The unit was evaluated for use up to 5000 meters altitude (correction factor for clearances: 1,48).

11) The requirements given in EN 60950-1:2001 incl. A11:2004 are fully covered by the requirements given in EN 60950-1:2006. The EN 60950-1:2006 incorporates several different requirements which do not have any influence on the requirements also given in EN 60950-1:2001 incl. EN 60950-1:2001/A11:2004. Therefore all products conforming to EN 60950-1:2006 will also be conform to EN 60950-1:2001 incl. A11:2004.

Information for Production testing to be done by the manufacturer:

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 3000Vac or 4242Vdc between live parts and accessible conductive parts (secondary circuit).

Additional information for the follow up engineer: