

Test Report issued under the responsibility of:



## TEST REPORT

### IEC 62368-1

### Audio/video, information and communication technology equipment Part 1: Safety requirements

Report Number	50331557 002
Date of issue	2020-12-11
Total number of pages	50 (see page 3 for attachment)
Applicant's name	TDK-Lambda (China) Electronics Co., Ltd.
Address	No.95, Zhujiang Road, Xinwu District, Wuxi 214028 Jiangsu, P.R. China
Test specification:	
Standard	IEC 62368-1:2014 (Second Edition)
Test procedure	CB Scheme
Non-standard test method	N/A
Test Report Form No	IEC62368_1B
Test Report Form(s) Originator:	UL(US)
Master TRF	2014-03
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Test Item description:	Switching Power Supply		
Trade Mark:	TDK-Lambda		
Manufacturer:	Same as applicant		
Model/Type reference:	CUS600M1- <b>z</b> xxxxxx, CME600A1- <b>z</b> xxxxxx, CUS500M1- <b>z</b> xxxxxx, CME500A- <b>z</b> xxxxxxx ( <b>z</b> = 12, 19, 24, 28, 32, 36 or 48; <b>x</b> xxxxxx = /T, /J, /M, /C, /C2, /SF, /G, /EF, other alphanumeric character, symbol or blank)		
Ratings:	See the model list on pages 9-11 for details		
Testing procedure and testing location:			
CB Testing Laboratory:	TÜV Rheinland Shanghai Co., Ltd.		
Testing location/ address:	No.177, 178, Lane 777 West Guangzhong Road, Jing'an District, Shanghai, China		
Associated CB Testing Laboratory:			
Testing location/ address :			
Tested by (name + signature):	Johnson Ma (Technical Expert)		
Approved by (name + signature):	Sunny Sun (Technical Reviewer)		
Testing procedure: TMP/CTF Stage 1	N/A		
Testing location/ address :			
Tested by (name + signature):			
Approved by (name + signature):			
Testing procedure: WMT/CTF Stage 2	N/A		
Testing location/ address:			
Tested by (name + signature)			
Witnessed by (name + signature):			
Approved by (name + signature):			
	Γ		
Testing procedure: SMT/CTF Stage 3 or 4	N/A		
Testing location/ address:			
Tested by (name + signature):			
Approved by (name + signature):			
Supervised by (name + signature):			

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

ATTACHMENT - Photo documentation (4 pages)

Note: Total number of pages in each attachment is indicated in individual attachment.

Testing location:
TÜV Rheinland Shanghai Co., Ltd. No.177, 178, Lane 777 West Guangzhong Road, Jing'an District, Shanghai, China

### **Derating Curve:**

### Convection cooling condition:

MODEL: C05000011-12/19/24/28/52/56/48						
T2 (°C)	Mounting A B C E	Mounting D				
14(0)	LOAD (%)	LOAD (%)				
-20 - +35	100	100				
40	100	91.4				
50	83.3	74.3				
60	66.7	57.1				
70	50	40				



### Forced air cooling condition:

MODEL:	CUS500M1-19/24/28/32/36	/48

T2 (°C)	Direction A D	Direction B	Direction C
14(0)	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +45	100	100	100
50	94	100	100
60	82	90	100
70	70	80	80



MODEL: CUS500M1-12

T- (%C)	Direction A	Direction B	Direction C	Direction D
Ia(C)	LOAD (%)	LOAD (%)	LOAD (%)	LOAD (%)
-20 - +30	90	100	100	90
40	82.5	100	100	90
45	78.8	100	100	90
50	75	100	100	86
60	67.5	90	100	78
70	<mark>6</mark> 0	80	80	70









TEST ITEM PARTICULARS:	
Classification of use by	☐ Ordinary person; ⊠ Instructed person
	Skilled person; Children likely to be present
Supply Connection	AC Mains; DC Mains
	External Circuit - not Mains connected
Supply % Tolerance	+10%/-10%;    +20%/-15%
	□ +%/%; □ None
Supply Connection – Type:	Dividing able equipment type A -
	direct plug-in
	mating connector
	pluggable equipment type B -
	non-detachable supply cord
	appliance coupler
	i i permanent connection i i mating connector □ other:
Considered current rating of protective device as	16 A or 20 A (for LIS/CSA) :
part of building or equipment installation	Installation location: 🛛 building; 🗌 equipment
Equipment mobility:	movable; hand-held; transportable;
	☐ stationary; ⊠ for building-in; ☐ direct plug-in;
Over voltage category (OVC):	
Class of equipment	
	Not classified
Access location:	$\square$ restricted access location $\square$ N/A
Pollution degree (PD)	□ PD 1
Manufacturer's specified maxium operating ambient:	70 °C
IP protection class:	⊠ IPX0 □ IP
Power Systems:	🖾 TN 🗌 TT 🛛 🖾 IT - 230 V L-L
Altitude during operation (m):	☐ 2000 m or less ⊠ up to 5000 m
Altitude of test laboratory (m):	🛛 2000 m or less 🔲 m
Mass of equipment (kg):	≈0.43 kg
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:	2020-08-17
Date (s) of performance of tests	2020-08-17 – 2020-08-28

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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 Declaratio	n per sub-o	clause 4.	.2.5 of IE	ECEE 02:		
The application for obtaining includes more than one fact declaration from the Manufa sample(s) submitted for eva representative of the produc been provided	g a CB Test cory location acturer statir iluation is (a cts from eac	Certifica and a ng that th re) h factory	te [ e has	⊠ Yes ] Not applicable		
When differences exist; th	ney shall be	identifi	ed in the	e General product inf	ormation section	on.
<ol> <li>Name and address of factory (ies).:</li> <li>1. Zhangjiagang Hua Yang Electronics Co., Ltd. Zhao Feng Industrial Zone, Leyu Town Zhangjiagang, 21562 Jiangsu, P.R. China</li> <li>2. TDK-Lambda (China) Electronics Co., Ltd. No. 95, Zhujiang Road, Xinwu District, Wuxi 214028 Jiangsu, P.R. China</li> <li>3. TDK-Lambda Malaysia Sdn. Bhd PLO33, Kawasan Perindustrian Senai, 81400 Senai Johor</li> </ol>					gang, 215622 28 Jiangsu, mai Johor	
		4.				
For rating differences bet Series Model	ween the n	nodels s	iee belo	<u>w tables:</u> Minimal output	Rated output	Maximum
	voltage (Vac)	(Hz)	Curren	t	(typical)	output
Convection cooling con	dition					
CUS600M1-12xxxxxxx	100-240	50-60	4.5	10.8Vdc	12Vdc	12.9Vdc
CME600A1-12xxxxxxx				10.8 Normal Ratir Peak Rating: 50	Vdc – 12.9Vdc g: 33.4A, 400.8\ )A, 600W Max. (	V Max. Dynamic)
CUS600M1-19xxxxxxx	100-240	50-60	4.5	17.1Vdc	19Vdc	20.5Vdc
CME600A1-19xxxxxxx				17.1 Normal Ratir Peak Rating: 31.6	Vdc – 20.5Vdc g: 21.1A, 400.9 6A, 600.4W Max	V Max. . (Dynamic)
CUS600M1-24xxxxxxx	100-240	50-60	4.5	21.6Vdc	24Vdc	25.9Vdc
CME600A1-24xxxxxxx				21.6 Normal Ratir Peak Rating: 2	Vdc – 25.9Vdc, ig: 16.7A, 400.8\ 5A, 600W Max. (	V Max. Dynamic)
CUS600M1-28xxxxxxx	100-240	50-60	4.5	25.2Vdc	28Vdc	30.2Vdc
CME600A1-28xxxxxxx				25.2 Normal Ratir Peak Rating: 21	Vdc – 30.2Vdc, lg: 14.3A, 400.4\ .5A, 602W Max.	N Max. (Dynamic)

CUS600M1-32xxxxxxx	100-240	50-60	4.5	28.8Vdc	32Vdc	34.5Vdc
CME600A1-32xxxxxxx				28.8	/dc – 34.5Vdc,	
				Normal Ratir	ng: 12.5A, 400V	V Max.
				Peak Rating: 18.8	A, 601.6W Max	. (Dynamic)
CUS600M1-36xxxxxxx	100-240	50-60	4.5	32.4Vdc	36Vdc	38.8Vdc
CME600A1-36xxxxxxx				32.4	/dc – 38.8Vdc,	
				Normal Ratin	g: 11.1A, 399.6	W Max.
				Peak Rating: 16.7	A, 601.2W Max	. (Dynamic)
CUS600M1-48xxxxxxx	100-240	50-60	4.5	43.2 Vdc	48 Vdc	51.8 Vdc
CME600A1-48xxxxxxx				43.2	/dc – 51.8Vdc,	
				Normal Ratir	ng: 8.4A, 403.2V	V Max.
				Peak Rating: 12.6	A, 604.8W Max	. (Dynamic)
CUS500M1-12xxxxxxx	100-240	50-60	4.0	10.8 Vdc	12 Vdc	12.9 Vdc
CME500A-12 <b>XXXXXXX</b>				10.8	/dc – 12.9Vdc,	
				Normal rati	ng: 25A, 300W	Max.
				Peak rating: 41.7	A, 500.4W Wax	
CUS500M1-19XXXXXXX	100-240	50-60	4.0	17.1 Vdc	19 Vdc	20.5 Vdc
CIVIESUUA-19XXXXXX				17.1	/dc – 20.5Vdc,	
				Normal rating	g: 15.8A, 300.2	W Max.
				Peak rating: 26.4	A, 501.6W Max	. (Dynamic)
CUS500M1-24xxxxxxx	100-240	50-60	4.0	21.6 Vdc	24 Vdc	25.9 Vdc
CME500A-24 <b>XXXXXXX</b>				21.6	/dc – 25.9Vdc,	
				Normal Ratin	ng: 12.5A, 300	N Max.
0110500144 00000000	400.040	50.00	4.0	Feak Rating. 20.9		
CUS500M1-28XXXXXXXX	100-240	50-60	4.0	25.2 Vdc	28 Vac	30.2 VdC
CIVIL JUUA-20AAAAAA				25.2	/dc – 30.2Vdc,	
				Normal Ratin	g: 10.7A, 299.6	W Max.
0110500144.00	400.040	50.00	4.0	Peak Rating: 17.9		
	100-240	50-60	4.0	28.8VdC	32VdC	34.5Vac
CIVIESUUA-SZAAAAAA				28.8V	/dc – 34.5Vdc,	
				Normal Ratir	1g: 9.4A, 300.8	W Max.
	400.040	50.00	4.0		A, 502.4W May	
CUS500101-36XXXXXXX CME500A-36XXXXXXX	100-240	50-60	4.0	32.4Vac	36740	38.8700
CIVIL JUON-JUANAAAA				32.4	/dc – 38.8Vdc,	
				Normal Ratir	1g: 8.3A, 298.8	w wax.
	400.040	50.00	4.0	Peak Rating. 15.9	A, 500.4W May	
CUS500101-46XXXXXXX CME5004-48XXXXXXX	100-240	50-60	4.0	43.2 Vac	46V0C	51.6700
				43.2V	/dc – 51.8Vdc,	A/ Max
				Normal Rating: 0.3A, 302.4W Max.		
	ition /sinfl-				5A, 504W WAX.	(Dynamic)
Forced air cooling cond				mis & air volume 2		10
CUS600M1-12xxxxxxx	100-240	50-60	7.0	10.8Vdc	12Vdc	12.9Vdc
				50A	50A	46.6A
CUS600M1-19xxxxxxx	100-240	50-60	7.0	17.1Vdc	19Vdc	20.5Vdc

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CME600A1-19xxxxxxx				31.6A	31.6A	29.3A
CUS600M1-24xxxxxxx	100-240	50-60	7.0	21.6Vdc	24Vdc	25.9Vdc
CME600A1-24 <b>xxxxxxx</b>				25A	25A	23.2A
CUS600M1-28xxxxxxx	100-240	50-60	7.0	25.2Vdc	28Vdc	30.2Vdc
CME600A1-28xxxxxxx				21.5A	21.5A	20.0A
CUS600M1-32xxxxxxx	100-240	50-60	7.0	28.8Vdc	32Vdc	34.5Vdc
CME600A1-32xxxxxxx				18.8A	18.8A	17.5A
CUS600M1-36xxxxxxx	100-240	50-60	7.0	32.4Vdc	36Vdc	38.8Vdc
CME600A1-36xxxxxxx				16.7A	16.7A	15.5A
CUS600M1-48xxxxxxx	100-240	50-60	7.0	43.2Vdc	48Vdc	51.8Vdc
CME600A1-48 <b>xxxxxxx</b>				12.6A	12.6A	11.7A
CUS500M1-12xxxxxxx	100-240	50-60	6.0	10.8Vdc	12Vdc	12.9Vdc
CME500A-12 <b>xxxxxxx</b>				41.7A	41.7A	38.8A
CUS500M1-19xxxxxxx	100-240	50-60	6.0	17.1Vdc	19Vdc	20.5Vdc
CME500A-19 <b>xxxxxxx</b>				26.4A	26.4A	24.5A
CUS500M1-24xxxxxxx	100-240	50-60	6.0	21.6Vdc	24Vdc	25.9Vdc
CME500A-24 <b>xxxxxxx</b>				20.9A	20.9A	19.4A
CUS500M1-28xxxxxxx	100-240	50-60	6.0	25.2Vdc	28Vdc	30.2Vdc
CME500A-28xxxxxxx				17.9A	17.9A	16.6A
CUS500M1-32xxxxxxx	100-240	50-60	6.0	28.8Vdc	32Vdc	34.5Vdc
CME500A-32 <b>xxxxxxx</b>				15.7A	15.7A	14.6A
CUS500M1-36xxxxxxx	100-240	50-60	6.0	32.4Vdc	36Vdc	38.8Vdc
CME500A-36 <b>xxxxxxx</b>				13.9A	13.9A	12.9A
CUS500M1-48xxxxxxx	100-240	50-60	6.0	43.2Vdc	48Vdc	51.8Vdc
CME500A-48xxxxxxx				10.5A	10.5A	9.8A

Remark:

Operating temp.: up to +70°C (operating temperature depending on equipment's load, mounting position, for details refer to instruction manual).

### Description of changes:

The previous approved models were modified as following:

- Add additional models CUS500M1-zxxxxxxx, CME500A-zxxxxxxx

(z = 12, 19, 24, 28, 32, 36 or 48; xxxxxx = /T, /J, /M, /C, /C2, /SF, /G, /EF, other alphanumeric character, symbol or blank), which are similar to original models CUS600M1-zxxxxxx, CME600A1-zxxxxxxx with following differences:

- Rated input current, output ratings.
- Add alternate heatsink combination 2. See below table for details:

Parts	Combination 1 (CUS600M1 heatsink)	Combination 2 (tested in this report)
KFA1 (Pri. side)	CA878-32-01x	CA922-32-01x
KFA2 (Pri. side)	CA878-32-03x	without
KFA3 (Sec. side)	CA878-32-05x (12V) (optional) CA878-32-04x (others) (optional)	without
HS201 & HS204 (Sec. side)	TZDD3271 (optional)	without
KKE1 (Sec. side)	CA878-33-01x (optional)	without

- Component parameter adjustment for MOSFET (Q1), Diode (D1), Primary Electrolytic Capacitor (C6) and Resistor (R108).
- Add additional factory TDK-Lambda Malaysia Sdn. Bhd, see factory list on page 9 for details.
- Correct typo error of external creepage from 5.0 mm to 8.0 mm for optocoupler.

# The models CUS500M1-**zxxxxxx** and CME500A-**zxxxxxxx** are identical except for the model designation.

All applicable tests were performed. Refer to above model list, test case and measurement section for details.

#### History of amendments and modifications:

Ref. No. 50331557 001, dated 2020-04-02 (original test report) Ref. No. 50331557 002, dated "see cover page" (1st modification)

#### Definition of variable(s):

CUS600M1-**zxxxxxx**, CME600A1-**zxxxxxx**, CUS500M1-**zxxxxxx**, CME500A-**zxxxxxx** (**z** = 12, 19, 24, 28, 32, 36 or 48; **xxxxxxx** = /T, /J, /M, /C, /C2, /SF, /G, /EF, other alphanumeric character, symbol or blank)

Variable:	Range of variable:	Content:
z	12, 19, 24, 28, 32, 36 or 48	Denoting output voltage from 12 Vdc to 48 Vdc.
XXXXXXX	blank	Denoting for Standard model.
	/Т	Denoting terminal block connector.
	/J	Denoting JST connector.
	/M	Denoting molex connector.
	/C or /CO	Denoting single side PWB coating.
	/C2 or /CO2	Denoting double side PWB coating.
	/SF	Denoting single fuse.
	/G	Denoting low earth leakage current.
	/EF	Denoting end fan. It is for class I construction only.
	other alphanumeric character, symbol	Used for market purposes, no construction differences and no safety impact.