

UL TEST REPORT AND PROCEDURE

Standard:	UL 62368-1, 3rd Ed, 2021-10-22 (Audio/video, information and communication technology equipment Part 1: Safety requirements) CAN/CSA C22.2 No. 62368-1:19, 3rd Ed, 2021-10-22 (Audio/video, information and communication technology equipment Part 1: Safety requirements)
Certification Type:	Component Recognition
CCN:	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
Complementary CCN:	N/A
Product:	AC-DC converter
Model:	LMF3000-20BXX, LMF3000-20BXX-C, LMF3000-20BXX-Q, LMF3000-20BXX-Y, LMF3000-20BXX-C-Y, LMF3000-20BXX-Q-Y, LMF3000-20BXX-YY, LMF3000-20BXX-C-YY, LMF3000-20BXX-Q-YY, LMF3000-20BXX-YYY, LMF3000-20BXX-C-YYY, LMF3000-20BXX-Q-YYY (XX can be 12, 24, 48, represents output voltage 12V, 24V, 48V. Y,YY and YYY, each Y can be any letters from A to Z, for marketing purpose. C represents the product terminal with plastic cover. Q represents the product power board with three anti-paint)
Rating:	Input: 100-180VAC, 20A Max, 50/60Hz 180-240VAC, 20A Max, 50/60Hz Output: See enclosure 07-04 for details.
Applicant Name and Address:	MORNSUN GUANGZHOU SCIENCE & TECHNOLOGY CO., LTD. NO.8, NANYUN ROAD 4, HUANGPU DISTRICT GUANGZHOU GUANGDONG SHENG 510670 CHINA

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of the first page of the Specific Technical Criteria through to the end of the Conditions of Acceptability.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Prepared By: Aven He / Project Handler

Reviewed By: Ranny Peng / Reviewer

Supporting Documentation

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
 - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
 - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
 - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

Product Description

1. The equipment is a building-in switch AC-DC converter of Audio and Video and Information Technology Equipment, electrical components are mounted on PWB, can't to be accessible when built- in final system.
2. There are total 3 types of PCB layout (PCB1, PCB2, PCB3), only secondary PCB layout difference, see attachment 3 for details. There are total 3 types of circuit schematic (SCH1, SCH2, SCH3), only secondary circuit difference.
3. The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification, see below and enclosure 7-04 for details:
 Ambient: 50°C, load with: 100% of Rating output power
 Ambient: 85°C, load with: 12.5% of Rating output power

Model Differences

1. All models are identical to each other except for secondary PCB layout, secondary circuit, transformer, model name, output rating, some electrical components, the terminal with plastic cover or not and the PCB with Three-proof paint or not.
 2. LMF3000-20BXX and LMF3000-20BXX-YYY are identical to each other except model name.
 3. LMF3000-20BXX and LMF3000-20BXX-YYY with terminal cover and Three-proof paint
 4. LMF3000-20BXX-C and LMF3000-20BXX-C-Y, LMF3000-20BXX-C-YY, LMF3000-20BXX-C-YYY are identical except for model name, these models with the terminal protective cover.
 5. LMF3000-20BXX-Q, LMF3000-20BXX-Q-Y, LMF3000-20BXX-Q-YY and LMF3000-20BXX-Q-YYY are identical except for model name, these models with the PCB Three-proof paint
- See enclosure 7-04 for details.

Test Item Particulars

Product group	built-in component
Classification of use by	Ordinary person Instructed person Skilled person
Supply Connection	AC Mains
Supply tolerance	+10%/-10%

Supply connection – type	built-in component, to be considered in the end system
Considered current rating of protective device	20, 30 A; Location: building
Equipment mobility	for building-in
Over voltage category (OVC)	OVC II
Class of equipment	Class I
Special installation location	N/A
Pollution degree (PD)	PD 2
Manufacturer's specified Tma (°C)	Max. 85°C
IP protection class	IPX0
Power systems	TN
Altitude during operation (m)	5000 or less m
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	3.4kg

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : Max. 85°C
- The product is intended for use on the following power systems : TN
- Considered current rating of protective device as part of the building installation (A) : 20 or 30
- Mains supply tolerance (%) or absolute mains supply : +10%/-10%
- The equipment disconnect device is considered to be : building-in equipment, shall evaluated in final system
- The following were investigated as part of the protective earthing/bonding : Metal chassis, Printed wiring board trace, bonding screw, additional requirements shall be evaluated in the final system.
- The following are available from the Applicant upon request : Installation (Safety) Instructions / Manual
- This equipment is intended to be operated under altitude up to 5,000m, so the clearance is multiplied by the altitude correction factor (1.48), specified in table 16 of UL62368-1.

Engineering Conditions of Acceptability

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- The end-product Electric Strength Test is to be based upon a maximum working voltage of : Primary-Secondary: 301 Vrms / 582Vpk.
- The following output circuits are at ES1 energy levels : Output terminal
- The following output circuits are at PS3 energy levels : Output terminal
- The maximum investigated branch circuit rating is : 20A or 30A.
- The investigated Pollution Degree is : 2
- The following end-product enclosures are required : Mechanical, Electrical, Fire
- The following magnetic devices (e.g. transformers or inductor) are provided with an OBJY2 insulation system with the indicated rating greater than Class A (105°C) : T1, TF1, T2, T3, T4 (Class B)
- The power supply was evaluated to be used at altitudes up to : "5,000 m"
- For building-in equipment, temperature of accessible surfaces tests and mechanical strength tests should be considered in end product
- The following were investigated as part of the protective earthing/bonding: Metal chassis, Printed wiring board trace, bonding screw, additional requirements shall be evaluated in the final system.
- The metal enclosure of the equipment should be reliably connected to protective earthing in end system. The additional Limited Short Circuit Test should be evaluated in final system (required by client).
- The openings of the enclosure should be evaluated in end product.
- When installed into the end system, connect earth before connecting L/N conductors, Disconnect earth after disconnecting L/N conductors.

Additional Information

N/A

Additional Standards

The product fulfills the requirements of: N/A

Markings and Instructions

Clause Title	Marking or Instruction Details
Equipment identification marking – Manufacturer identification	Listee’s or Recognized Company’s name, Trade Name, Trademark or File Number
Equipment identification marking – model identification	Model Number
Equipment rating marking – ratings	"Input Ratings (voltage, frequency/dc, current/power)", "Output Ratings (voltage, frequency/dc, current/power)"
Fuses – replaceable by skilled person	(component ID: F1, F2), Ratings (300Vac, T25A) and (symbol of required characteristics) located on or adjacent to fuse or fuseholder or in service manual.

Special Instructions to UL Representative

[X] For transformer test - When the tests are conducted at other location, inspect test record and specification sheet provided by the component manufacturer. Verify the specification sheet indicates 100% routine test specified in Production-Line Testing Requirements be conducted at the component manufacturer.

BD1.0						
TABLE: Production-Line Testing Requirements						
BD1.1						
Electric Strength Test Special Constructions – Refer to Generic Inspection Instructions, Part AC for further information.						
Model	Component	Removable parts	Test probe location	Test V rms	Test V dc	Test Time, s
All Models	All Transformer	--	Primary to Secondary	2829 Vrms / 4000 Vpk	4000	1s
BD1.2						
Earthing Continuity Test Exemptions – This test is not required for the following models:						
None						
BD1.3						
Electric Strength Test Exemptions – This test is not required for the following models:						
None						
BD1.4						
Electric Strength Test Component Exemptions – The following solid-state components may be disconnected from the remainder of the circuitry during the performance of this test.						
--						

BE1.0					
Sample and Test Specifics for Follow-Up Tests at UL					
Model	Component	Material	Test	Sample (s)	Test Specifics
--	--	--	--	--	--

Enclosures

Type	Supplement Id	Description
Photographs	03-01	Overall view 1
Photographs	03-02	Overall view 2
Photographs	03-03	Internal view 1
Photographs	03-04	Internal view 2
Photographs	03-05	Internal view 3
Photographs	03-06	Internal view 4
Photographs	03-07	Fan view 1
Photographs	03-08	Fan view 2
Photographs	03-09	Terminal view
Photographs	03-10	Top view of PCB (PCB1, SCH1)
Photographs	03-11	Bottom view of PCB (PCB1, SCH1)
Photographs	03-12	Top view of PCB (PCB2, SCH2)
Photographs	03-13	Bottom view of PCB (PCB2, SCH2)
Photographs	03-14	Top view of PCB (PCB3, SCH3)
Photographs	03-15	Bottom view of PCB (PCB3, SCH3)
Photographs	03-16	Transformer view 1
Photographs	03-17	Transformer view 2
Photographs	03-18	Transformer view 3
Photographs	03-19	Transformer view 4
Photographs	03-20	Transformer view 5
Photographs	03-21	Transformer view 6
Photographs	03-22	Transformer view 7
Photographs	03-23	Transformer view 8
Photographs	03-25	Overall view of unit (with terminal cover)
Diagrams	04-01	Inductor (LF3) spec
Diagrams	04-02	Inductor (LF1, LF2) spec
Diagrams	04-03	Inductor (L1, L2) spec
Diagrams	04-04	Inductor (L102) spec
Diagrams	04-05	Transformer (T1) spec
Diagrams	04-06	Transformer (T2,T3) spec
Diagrams	04-07	Transformer (T4) spec
Diagrams	04-08	Transformer (TF1) spec.
Schematics + PWB	05-01	Main PCB1 layout (for model with 12V output)
Schematics + PWB	05-02	Main PCB2 layout (for model with 24V output)
Schematics + PWB	05-03	Main PCB3 layout (for model with 48V output)
Schematics + PWB	05-04	PCB layout of Secondary small board (for all models)

Miscellaneous	07-01	Enclosure dimension drawing (unit: mm)
Miscellaneous	07-02	Heatsink dimension drawing (unit: mm)
Miscellaneous	07-03	Insulation sheet dimension drawing (unit: mm)
Miscellaneous	07-04	Model list