

## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	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)
<b>Certification Type:</b>	Component Recognition
<b>CCN:</b>	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
<b>Complementary CCN:</b>	N/A
<b>Product:</b>	Power supply
<b>Model:</b>	UZF-400-x12y, UZF-400-x24y, UZF-400-x36y, UZF-400-x48y, mUZF-400-x12y, mUZF-400-x24y, mUZF-400-x36y, mUZF-400-x48y (UZF-400 series) UZF-400/1200P-x24y, UZF-400/1200P-x30y, UZF-400/1200P-x36y, UZF-400/1200P-x40y, UZF-400/1200P-x48y, mUZF-400/1200P-x24y, mUZF-400/1200P-x30y, mUZF-400/1200P-x36y, mUZF-400/1200P-x40y, mUZF-400/1200P-x48y (UZF-400/1200P series) UZF-400-HV/x24Vy (except for UZF-400-HV/x24V-JBH1), UZF-400-HV/x24V-JBH1 (UZF-400 series) (where x maybe alphanumeric character or blank, which denotes control number. where y maybe maximum 20 characters, any alphanumeric character, slash, hyphen or blank, which denotes control number)
<b>Rating:</b>	For UZF-400-x12y, mUZF-400-x12y Input rating: 100-240V ~, 50-60Hz, 5.0A Output rating: - 12Vdc, 26.7A (42 Apeak) (Maximum, at un-forced airflow) - 12Vdc, 36A (42 Apeak) (Maximum, at forced airflow)  For UZF-400-x24y, mUZF-400-x24y Input rating: 100-240V ~, 50-60Hz, 5.5A Output rating: - 24Vdc, 16.8A (25 Apeak) (Maximum, at un-forced airflow) - 24Vdc, 21A (25 Apeak) (Maximum, at forced airflow)  For UZF-400-x36y, mUZF-400-x36y Input rating: 100-240V ~, 50-60Hz, 5.5A Output rating: - 36Vdc, 11.2A (16.7 Apeak) (Maximum, at un-forced airflow)

- 36Vdc, 14A (16.7 Apeak) (Maximum, at forced airflow)

For UZP-400-x48y, mUZP-400-x48y

Input rating: 100-240V ~, 50-60Hz, 5.5A

Output rating:

- 48Vdc, 8.4A (12.5 Apeak) (Maximum, at un-forced airflow)

- 48Vdc, 10.5A (12.5 Apeak) (Maximum, at forced airflow)

For UZP-400/1200P-x24y, mUZP-400/1200P-x24y

Input rating: 200-240V ~, 50-60Hz, 2.8A

Output rating:

- 24Vdc, 16.8A (50 Apeak) (Maximum, at un-forced airflow)

- 24Vdc, 21A (50 Apeak) (Maximum, at forced airflow)

For UZP-400/1200P-x30y, mUZP-400/1200P-x30y

Input rating: 200-240V ~, 50-60Hz, 2.8A

Output rating:

- 30Vdc, 13.4A (40 Apeak) (Maximum, at un-forced airflow)

- 30Vdc, 16.8A (40 Apeak) (Maximum, at forced airflow)

For UZP-400/1200P-x36y, mUZP-400/1200P-x36y

Input rating: 200-240V ~, 50-60Hz, 2.8A

Output rating:

- 36Vdc, 11.2A (33.4 Apeak) (Maximum, at un-forced airflow)

- 36Vdc, 14A (33.4 Apeak) (Maximum, at forced airflow)

For UZP-400/1200P-x40y, mUZP-400/1200P-x40y

Input rating: 200-240V ~, 50-60Hz, 2.8A

Output rating:

- 40Vdc, 10A (30 Apeak) (Maximum, at un-forced airflow)

- 40Vdc, 12.5A (30 Apeak) (Maximum, at forced airflow)

For UZP-400/1200P-x48y, mUZP-400/1200P-x48y

Input rating: 200-240V ~, 50-60Hz, 2.8A

Output rating:

- 48Vdc, 8.4A (25 Apeak) (Maximum, at un-forced airflow)

- 48Vdc, 10.5A (25 Apeak) (Maximum, at forced airflow)

For UZD-400-HV/x24Vy

Input rating: 135-370Vdc, 4.0A

Output rating:

- 24Vdc, 16.8A (25 Apeak) (Maximum, at un-forced airflow)

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	<p>- 24Vdc, 21A (25 Apeak) (Maximum, at forced airflow)</p> <p>For UZD-400-HV/x24V-JBH1</p> <p>Input rating: 280Vdc, 1.53A</p> <p>Output rating:</p> <p>- 24Vdc, 9.2A (25 Apeak) (Maximum, at un-forced airflow)</p>
<b>Applicant Name and Address:</b>	<p>NIPRON CO LTD</p> <p>2-57 OHAMA-CHO</p> <p>AMAGASAKI-SHI</p> <p>HYOGO-KEN 660-0095 JAPAN</p>

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: Yoshifusa Koyanagi / Project  
Handler

Reviewed By: Tomohiko Maeda / 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

The product is a building-in type switching power supply.

### Model Differences

UZP-400-x24y is basal model.

- Model UZP-400-x36y is identical to UZP-400-x24y except for output rating and transformer (T1) type.

- Model UZP-400-x48y is identical to UZP-400-x24y except for output rating and transformer (T1) type.

- Model UZP-400-x12y is identical to UZP-400-x24y except for input rating, output rating, transformer (T1) type, and output derating.

- Model UZP-400/1200P-x24y is identical to UZP-400-x24y except for input rating, output rating, output derating, transformer (T1) type, and some components.

- Model UZP-400/1200P-x30y is identical to UZP-400/1200P-x24y except for output rating and transformer (T1) type.

- Model UZP-400/1200P-x36y is identical to UZP-400/1200P-x24y except for output rating and transformer (T1) type.

- Model UZP-400/1200P-x40y is identical to UZP-400/1200P-x24y except for output rating and transformer (T1) type.

- Model UZP-400/1200P-x48y is identical to UZP-400/1200P-x24y except for output rating and transformer (T1) type.

- Model UZD-400-HV/x24Vy is identical to UZP-400-x24y except for Input rating, Input derating, and some components of primary circuits.

- Model UZD-400-HV/x24V-JBH1 is identical to UZD-400-HV/x24Vy except for Input rating, no Input derating, Output rating, and transformer (T1) type.

With or Without the prefix "m" does not affect to safety requirements.

Where x maybe alphanumeric character or blank, which denotes control number. where y maybe maximum 20 characters, any alphanumeric character, slash, hyphen or blank, which denotes control number.

#### Test Item Particulars

**Product group** ..... : built-in component  
**Classification of use by** ..... : Ordinary person  
**Supply Connection**..... : AC Mains  
not mains connected:  
ES3  
**Supply tolerance**..... : + 10 % / - 15 %  
**Supply connection – type**..... : Connector  
**Considered current rating of protective device ...** : 20 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)** ..... : See Enclosure Id 07-01  
**IP protection class**..... : IPX0  
**Power systems** ..... : TN  
IT - 230 V L-L  
**Altitude during operation (m)**..... : 4000 m  
**Altitude of test laboratory (m)** ..... : 2000 m or less  
**Mass of equipment (kg)** ..... : Approximately 0.57

#### 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 following product-line tests are conducted for this product : Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of : Primary-Secondary: 263 Vrms / 508 Vpk
- The following output circuits are at ES1 energy levels : All output
- The following output circuits are at PS3 energy levels : All output
- Proper bonding to the end-product main protective earthing termination is : Required
- An investigation of the protective bonding terminals has : not been conducted
- The following input terminals/connectors must be connected to the end-product supply neutral : Input Connector (CN1) 3 pin
- The following end-product enclosures are required : 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 of Models UZP-400 series, UZP-400/1200P series, and UZD-400-HV/x24Vy (Class F), T1 of Models UZD-400-HV/x24V-JBH1 and UZD-150-HVD/x36V-0BL1 (Class B)
- The power supply terminals and/or connectors are: Suitable for factory wiring only
- Peak current of Output is not evaluated in this report.
- The Heating Test shall be evaluated in the end-product.
- The Varistor (ZNR2 and ZNR4) shall be evaluated in the end-product, if fire enclosure provided in the end-product is made from combustible material and located less than 13 mm from the varistor.  
Applicable requirement is Annex G.8.2.

#### **Additional Information**

Regarding the Derating of temperature of Tma and Input Voltage, and sample position, see Enclosure Id: 07-01 for details.

##### **[UZP-400 series]**

Models UZP-400-x36y and UZP-400-x48y are identical to UZP-400-x24y except for output rating. Also, Model UZP-400-x12y is identical to UZP-400-x24y except for input rating, output rating. Due to the similarity of circuit, following tests were conducted with UZP-400-x24y as a representative.

- CAPACITOR DISCHARGE AFTER DISCONNECTION OF A CONNECTOR
- TOUCH CURRENT MEASUREMENT – EARTHED ACCESSIBLE CONDUCTIVE PARTS – SINGLE-PHASE EQUIPMENT ON TN OR TT SYSTEM
- TOUCH CURRENT MEASUREMENT – EARTHED ACCESSIBLE CONDUCTIVE PARTS – SINGLE-PHASE EQUIPMENT ON IT SYSTEM
- SIMULATED SINGLE FAULT CONDITIONS

CLASSIFICATION OF ELECTRICAL ENERGY SOURCES was conducted with model UZP-400-x48y as the most severe model.

Models UZP-400-x24y, UZP-400-x36y, and UZP-400-x48y have 5 type pattern layout, type 3700P1, 3700P13, 3700P15, and 3818P1 (Connector Type), 3764P1 (Terminal Block Type).

The difference between type 3700P1 and 3700P13 is IC101. Also, the difference between type 3700P13 and 3700P15 is deletion of Bleeder Resistors (R1, R3, R5) and addition of Connector (CN9). Also type 3818P1 is minor change version of type 3700P13. Since electrical characteristic of each IC101 are same and the difference of pattern layout does not affect safety, Bleeder Resistors (R1, R3, R5) are 0ohm resistors and does not affect test result, test was conducted with type 3700P1 as representative.

Model UZP-400-x12y has 3 type pattern layout, type 3700P11, 3700P14 (Connector Type), 3764P11 (Terminal Block Type).

Type 3700P14 is minor change version of type 3700P11, and the difference does not affect clearance/creepage.

##### **[UZP-400/1200P series]**

Models UZP-400/1200P-x30y, UZP-400/1200P-x36y, UZP-400/1200P-x40y, UZP-400/1200P-x48y are identical to UZP-400/1200P-x24y except for output rating. Due to the similarity of circuit, following tests were conducted with UZP-400/1200P-x24y as a representative.

- SIMULATED SINGLE FAULT CONDITIONS

Also, Due to the similarity of circuit between UZP-400 series and UZP-400/1200P series, following tests were conducted with UZP-400-x24y as a representative.

- CAPACITOR DISCHARGE AFTER DISCONNECTION OF A CONNECTOR
- TOUCH CURRENT MEASUREMENT – EARTHED ACCESSIBLE CONDUCTIVE PARTS – SINGLE-PHASE EQUIPMENT ON TN OR TT SYSTEM
- TOUCH CURRENT MEASUREMENT – EARTHED ACCESSIBLE CONDUCTIVE PARTS – SINGLE-PHASE EQUIPMENT ON IT SYSTEM

CLASSIFICATION OF ELECTRICAL ENERGY SOURCES was conducted with model UZP-400/1200P-x48y as the most severe model.

These product have 4 type pattern layout, type 3725P1, 3725P13, and 3725P15 (Connector Type), 3806P1 (Terminal Block Type).

The difference between type 3725P1 and 3725P13 is IC101. Also, the difference between type 3725P13 and 3725P15 is deletion of Bleeder Resistors (R1, R3, R5). Since electrical characteristic of each IC101 are same

and the difference of pattern layout does not affect safety, Bleeder Resistors (R1, R3, R5) are 0ohm resistors and does not affect test result, and type 3725P1 does not have this protection function, test was conducted with type 3725P1 as representative.

Model UZP-400/1200P-x24y has another 1 type pattern layout, type 3725P16.  
Type 3725P16 is minor change version of type 3725P13, and the difference does not affect clearance/creepage.

[UZD-400 series]

Model UZD-400-HV/x24Vy is identical to UZP-400-x24y except for Input rating, Input derating, and some components of primary circuits.

Model UZD-400-HV/x24V-JBH1 is identical to UZD-400-HV/x24Vy except for Input rating, no Input derating, Output rating, and transformer (T1) type.

Due to the similarity of circuit, following tests were conducted.

- CLASSIFICATION OF ELECTRICAL ENERGY SOURCES
- TEST FOR HYGROSCOPIC MATERIALS
- DETERMINATION OF WORKING VOLTAGE
- ELECTRIC STRENGTH TEST
- CAPACITOR DISCHARGE AFTER DISCONNECTION OF A CONNECTOR
- INPUT TEST: SINGLE PHASE
- NORMAL OPERATING CONDITIONS TEMPERATURE MEASUREMENT
- SIMULATED ABNORMAL OPERATING CONDITIONS
- SIMULATED SINGLE FAULT CONDITIONS
- CONDITIONING AND OVERLOAD TEST

These product have 1 type pattern layout, type 3747P1.

(for CB Application)

This report is a reissue of CBTR Ref. No. E161936-A6044-CB-1 including Amendment 1, Amendment 2, Amendment 3.

Based on the previously conducted testing and the review of product technical documentation including photos, schematics, wiring diagrams and similar, has been determined that the product continues to comply with the standard.

This reissue report is to cover modification as follows.

- Addition of similar models, UZD-400-HV/x24Vy and UZD-400-HV/x24V-JBH1.
- Correction of Description of Material of Input Connector (CN1) Types CM3004-V0 and PA66-RNG00, from "Material of Input Connector (CN1) (for Models UZP-400 series)" to "Material of Input Connector (CN1)"
- Correction of Type of Input Terminal Block (TB1), from "GMKDS 1.5" to "GMKDSN 1.5" due to typo.
- Addition of alternate FUSE insulation : FUSE holder, Type FUSCV-1.
- Correction of Type of X-Capacitor (C1), from "LE series" to "LE.
- Addition of alternate X-Capacitor (C1), Types LE-MX, LE-FX, and LE-NX.
- Addition of alternate X-Capacitor (C1), Type FSX.
- Correction of capacitor sub-class of Y-Capacitor (C4, C5, C6) (except for Models UZD-400 series), Types SA and KY, from Y1 to Y2.
- Addition of alternate Y-Capacitors (C4, C5, C6) (except for Models UZD-400 series), Type CS.
- Correction of Type of Bleeder Resistors (R1, R3, R5) (for PWB types 3700P1, 3700P13, 3725P1, 3725P13 only), from "RK73Z2A" to "RK73Z".
- Correction of Type of Bleeder Resistors (R2, R4), from "SG73" to "SG73P".
- Correction of manufacturer name of Core Case of Line Filter (LF1, LF2) (except for Models UZP-400/1200P series) Type 5010N6, from "Mitsubishi Engineering-Plastics Corp." to "Mitsubishi Chemical Corporation".
- Addition of Alternate Core Case of Line Filter (LF1, LF2) (except for Models UZP-400/1200P series), Type LUPOX GP1006FD.

- Correction of manufacturer name of Case of Line Filter (LF1, LF2) (except for Models UZP-400/1200P series) Type LUPOX GP-1006F, from "LG Chem Ltd." to "LG Chem (Guangzhou) Engineering Plastics Co Ltd or LG Chem Haiphong Engineering Plastics LLC".
- Addition of alternate Diode Bridge (D1), Types D15XB60H and GBJL1508.
- Addition of alternate Optical Isolators (PC1, PC2, PC3), Type TLP385.
- Addition of Optical Isolators (PC4) (for Model UZP-400-x24y), Types TLP383, TLP385, LTV-10XX.
- Change components of Transformer (T1) Types MT1801, MT7801, MT1802, MT7802, MT1803, MT7803, MT1804, MT7804, MT1808, MT7808, MT1809, MT7809, MT1810, MT7810, MT1816, MT7816, MT1847, MT7847. (See Enclosure Ids 07-05, 07-06, 07-07, 07-15, 07-16, 07-17, 07-18, 07-19, 07-20 for details).
- Addition of optional Standby Power Supply, Type PS-10WP-12VSBnz.
- Correction of Type of Capacitor Pack, from CB01 to CB01\*.
- Addition of alternate Optical Isolator (PC1) of Capacitor Pack CB01\*, Types TLP785F and LTV-816.
- Addition of optional Capacitor Pack, Type CB04\*.
- Addition of optional Sub-power supply unit, Type UZD-150-HVD/x36V-0BL1.
- Addition of original tested component information to manufacturer and type name for some components described as "Interchangeable".
- Correction of manufacturer, type name for some components described as "Interchangeable" to "--".

Based on previously conducted testing and the review of product construction, only limited tests below were considered necessary.

- 5.2.2.1-5.2.2.6 – CLASSIFICATION OF ELECTRICAL ENERGY SOURCES
- 5.4.1.3 – TEST FOR HYGROSCOPIC MATERIALS
- 5.4.1.8 – DETERMINATION OF WORKING VOLTAGE
- 5.4.9.1 – ELECTRIC STRENGTH TEST – TYPE TESTING OF SOLID INSULATION
- 5.5.2.2 – CAPACITOR DISCHARGE AFTER DISCONNECTION OF A CONNECTOR
- B.2.5 – INPUT TEST: SINGLE PHASE
- B.2.6, 5.4.1.4, 6.3, 9.3, B.1.5 – NORMAL OPERATING CONDITIONS TEMPERATURE MEASUREMENT
- B.3 – SIMULATED ABNORMAL OPERATING CONDITIONS
- B.4 – SIMULATED SINGLE FAULT CONDITIONS
- G.10.2, G.10.6 - CONDITIONING AND OVERLOAD TEST

UL Standard has requirements that meet or exceed relevant IEC requirements.

The marking plate label provided is representative of all series models because the required information except for model name is same as representative.

#### Additional Standards

The product fulfills the requirements of: EN IEC 62368-1:2020+A11:2020, CSA/UL 62368-1:2019

#### 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 ordinary or instructed person	<p>Except for Models UZD-400-HV/x24Vy and UZD-400-HV/x24V-JBH1: (component ID: F1, F2), Ratings (10AL or 10AH, 250V) and (T) located on or adjacent to fuse or fuseholder</p> <p>Models UZD-400-HV/x24Vy and UZD-400-HV/x24V-JBH1: (component ID: F1, F2), Ratings (400V 10A) located on or adjacent to fuse or fuseholder</p>
<p><b>Special Instructions to UL Representative</b></p> <p>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.</p>	

<b>BD1.0</b>						
<b>TABLE: Production-Line Testing Requirements</b>						
<b>BD1.1</b>						
<b>Electric Strength Test Special Constructions – Refer to Generic Inspection Instructions, Part AC for further information.</b>						
Model	Component	Removable parts	Test probe location	Test V rms	Test V dc	Test Time, s
All models	Transformer (T1), type MT1801x, MT7801x, MT1802x, MT7802x, MT1803x, MT7803x, MT1804x, MT7804x, MT1808x, MT7808x, MT1809x, MT7809x, MT1810x, MT7810x, MT1816x, MT7816x, MT1828x, MT1829x, MT1847x, MT7847x	--	Primary to Secondary	4000pk	4000	1
<b>BD1.2</b>						
<b>Earthing Continuity Test Exemptions – This test is not required for the following models:</b>						
All models						
<b>BD1.3</b>						
<b>Electric Strength Test Exemptions – This test is not required for the following models:</b>						
N/A						
<b>BD1.4</b>						
<b>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.</b>						
N/A						

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