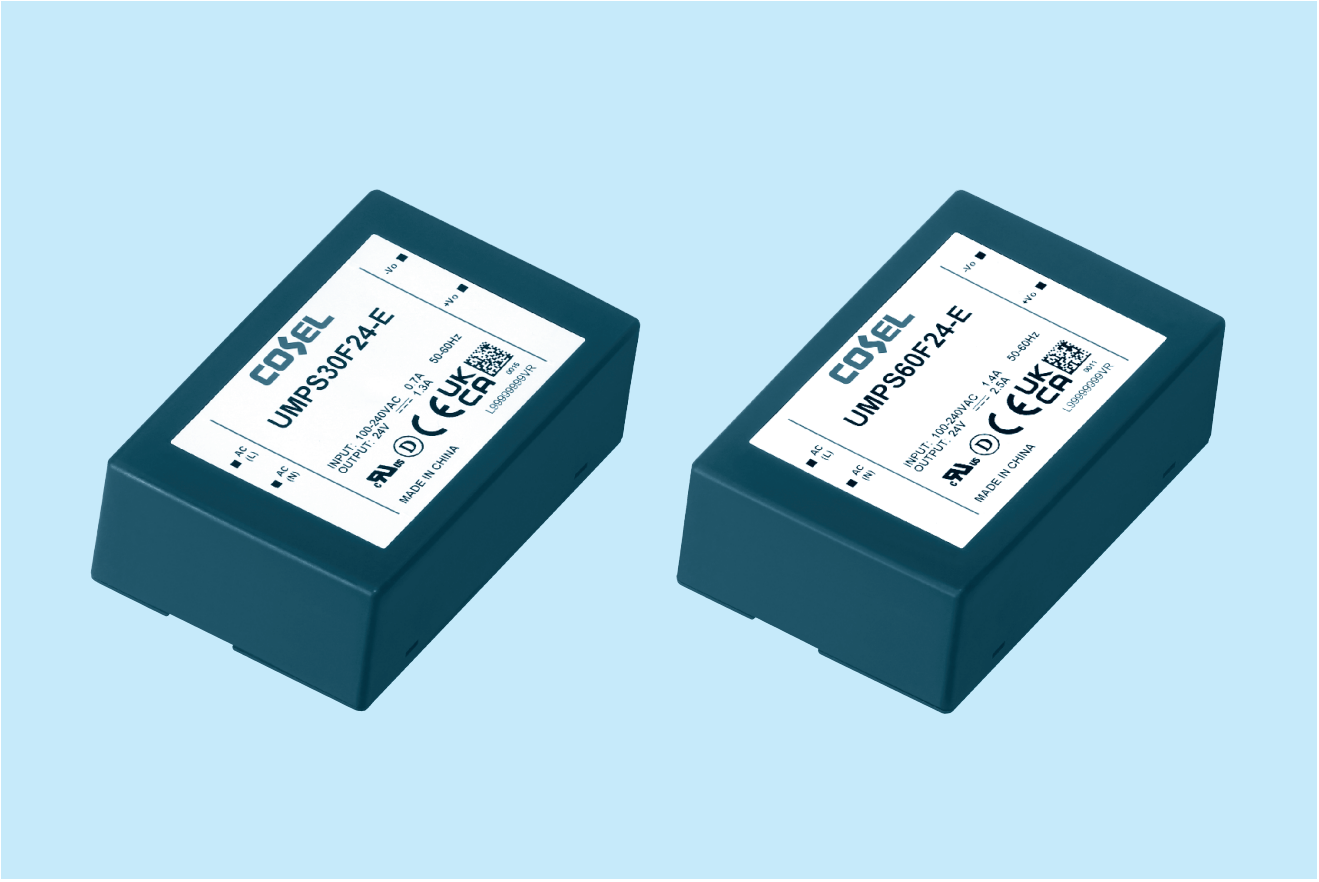
COSEL

Medical electric equipment | World wide | Cost Effective | Safety Approvals | EMI | Inrush current limiting | OCP | OVP

# UMPS-series




## Feature

For medical electric equipment
Medical Isolation Grade 2MOPP
4kV isolation
Suitable for BF application
Low leakage current
Economical design
Class II

## Safety agency approvals

ANSI/AAMI ES60601-1, EN60601-1 3rd,
C-UL (CAN/CSA-C22.2 No.60601-1),
UL62368-1, EN62368-1,
C-UL (CAN/CSA-C22.2 No.62368-1)
Complies with IEC60335-1

## CE marking

Low Voltage Directive
RoHS Directive

## UKCA marking

Electrical Equipment Safety Regulations
RoHS Regulations

## 5-year warranty (Refer to Instruction Manual)

## EMI

Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B,
FCC Part 15-B, FCC Part 18-B

## EMS Compliance : EN61204-3, EN61000-6-2

IEC60601-1-2 (2014), EN60601-1-2 (2015)

EN61000-4-2
EN61000-4-3
EN61000-4-4
EN61000-4-5
EN61000-4-6
EN61000-4-8
EN61000-4-11

COSEL AC-DC Power Supplies Medical Type

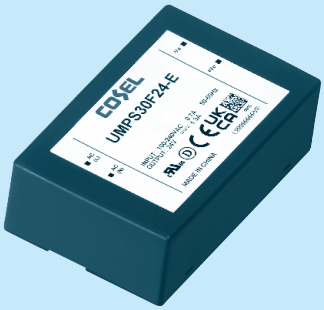
# UMPS30F

## Ordering information

| UMP | S | 30 | F | □□ | -□ |
|---|---|---|---|---|---|
| ① | ② | ③ | ④ | ⑤ | ⑥ |

①Series name
②Single output
③Output wattage
④Universal input
⑤Output voltage
⑥Optional

RoHS




ClassII

*Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

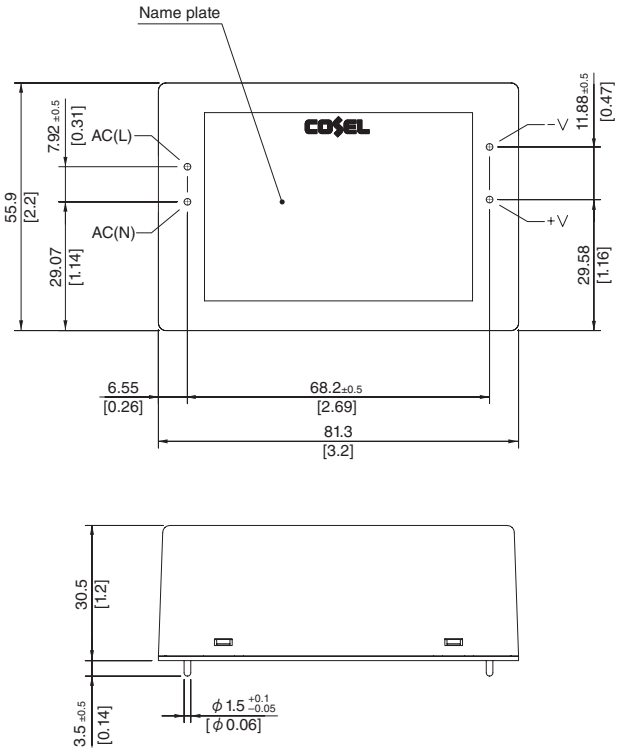
| MODEL | UMPS30F05-E | UMPS30F12-E | UMPS30F24-E | UMPS30F48-E |
|---|---|---|---|---|
| MAX OUTPUT WATTAGE[W] | 15 | 30 | 31.2 | 31.2 |
| DC OUTPUT | 5V 3A | 12V 2.5A | 24V 1.3A | 48V 0.65A |

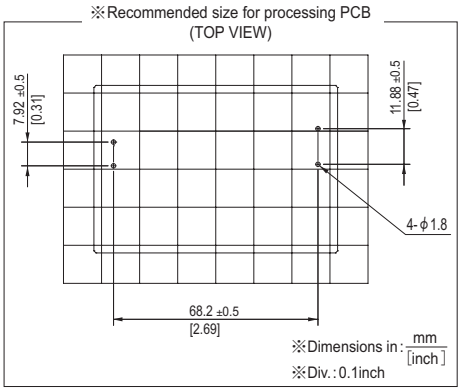
## SPECIFICATIONS

| | MODEL | | UMPS30F05-E | UMPS30F12-E | UMPS30F24-E | UMPS30F48-E |
|---|---|---|---|---|---|---|
| INPUT | VOLTAGE[V] | | AC85 - 264 1φ | | | |
| | CURRENT[A] | ACIN 115V | 0.35 | 0.7 | | |
| | | ACIN 230V | 0.15 | 0.3 | | |
| | FREQUENCY[Hz] | | 50/60 (47-63) | | | |
| | EFFICIENCY[%] | ACIN 115V | 81typ | 86typ | 88typ | 88typ |
| | | ACIN 230V | 80typ | 87typ | 89typ | 89typ |
| | INRUSH CURRENT[A] | ACIN 115V | 25typ | | | |
| | | ACIN 230V | 50typ | | | |
| | LEAKAGE CURRENT[uA] | ACIN 264V | 200max | | | |
| | TOUCH CURRENT[uA] | ACIN 264V | 75max | | | |
| OUTPUT | VOLTAGE[V] | | 5 | 12 | 24 | 48 |
| | CURRENT[A] | | 3 | 2.5 | 1.3 | 0.65 |
| | WATTAGE[W] | | 15 | 30 | 31.2 | 31.2 |
| | LINE REGULATION[mV] *1 | | 20max | 48max | 96max | 192max |
| | LOAD REGULATION[mV] *1 | | 100max | 120max | 150max | 240max |
| | RIPPLE NOISE [mVp-p] *2 | Io=100% | 150 (Bandwidth 20MHz) | | | |
| | TEMPERATURE REGULATION[mV] | 0~+45℃ | 100max | 120max | 240max | 480max |
| | START-UP TIME[ms] | ACIN 115V<br>ACIN 230V | 40typ | | | |
| | HOLD-UP TIME[ms] | ACIN 115V | 20typ | | | |
| | | ACIN 230V | 100typ | | | |
| | OUTPUT VOLTAGE SETTING[V] | | 4.90 to 5.30 | 11.50 to 12.50 | 23.00 to 25.00 | 46.00 to 50.00 |
| PROTECTION CIRCUIT AND OTHERS | OVERCURRENT PROTECTION [A] | | Works over 105% of rating and recovers automatically | | | |
| | OVERVOLTAGE PROTECTION[V] | | 5.75 to 7.00 | 13.80 to 16.80 | 27.60 to 33.60 | 55.20 to 67.20 |
| ISOLATION | INPUT-OUTPUT | | AC4,000V 1minute, DC500V 100MΩmin (At Room Temperature) 2MOPP | | | |
| ENVIRONMENT | OPERATING TEMP.,HUMID. *3 | | -20 to +70℃, 20 - 90%RH (Non condensing) | | | |
| | STORAGE TEMP.,HUMID. | | -20 to +75℃, 20 - 90%RH (Non condensing) | | | |
| | VIBRATION | | 10 - 55Hz, 19.6m/s² (2G) , 3minutes period, 60minutes each along X, Y and Z axis | | | |
| | IMPACT | | 196.1m/s² (20G) , 11ms, once each X, Y and Z axis | | | |
| SAFETY AND EMC | AGENCY APPROVALS | | UL62368-1, C-UL (equivalent to CAN/CSA-C22.2 No.62368-1), EN62368-1, ANSI/AAMI ES60601-1, C-UL (equivalent to CAN/CSA-C22.2 No.60601-1), EN60601-1 3rd, Complies with IEC60335-1 | | | |
| | EMC EMISSON | | Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part 15-B, FCC Part 18-B | | | |
| | EMC EMMUNITY | | Complies with EN61000-4-2, 3, 4, 5, 6, 8, 11 | | | |
| | HARMONIC ATTENUATOR *5 | | Complies with IEC61000-3-2 (Class A) No built-in active PFC | | | |
| OTHERS | CASE SIZE/WEIGHT | | 55.9×30.5×81.3mm [2.2×1.2×3.2 inches] (W×H×D) / 170g max | | | |
| | COOLING METHOD | | Convection | | | |
| WARRANTY | WARRANTY *4 | | 5 years (subject to the operating conditions) | | | |

*1 Consult us about dynamic load and input response. Measure the output voltage by using the average mode of the tester to deal with the burst operation at low (Io=0~20%typ) load.
*2 This is the result of measurement of the testing board with capacitors of 47μF and 0.1μF placed at 50 mm from the output terminals by a 20MHz oscilloscope or a ripple-noise meter equivalent to Keisoku-GikenRM104.
When the load factor is low (Io=0~20%typ), the switching power loss is reduced by burst operation, which will cause ripple noise to go beyond the specifications.
*3 Output power derating is required. Refer to "Derating"
*4 Consult us about details.
*5 Please contact us about another class. When two or more units are operating it may not comply with the IEC61000-3-2. Please contact us for details.
* All parameters not specially mentioned are measured at ACIN 230V, rated load and 25℃ of ambient temperature.
* Do not use the power supply in overcurrent conditions or in unspecified input voltage ranges. Otherwise the internal components may be damaged.
* Parallel operation is not possible with this model.
* Acoustic noise may be heard from the power supply when used for pulse load.

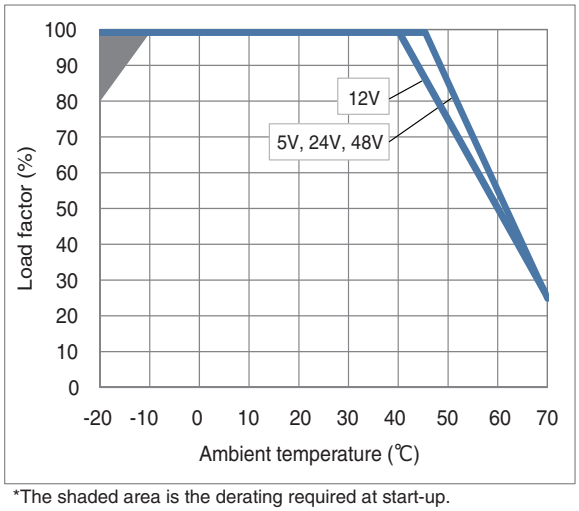
## External view




※ Dimensions in mm, [ ] = inches
※ Tolerance : ±1 [±0.04]
※ Weight : 170g max
※ Pin terminal material : Copper
※ Plating treatment of terminal : Lead free plating
※ Case material :PBT

## Derating Curve




*The shaded area is the derating required at start-up.

Fig.1 Derating curve depending on ambient temperature

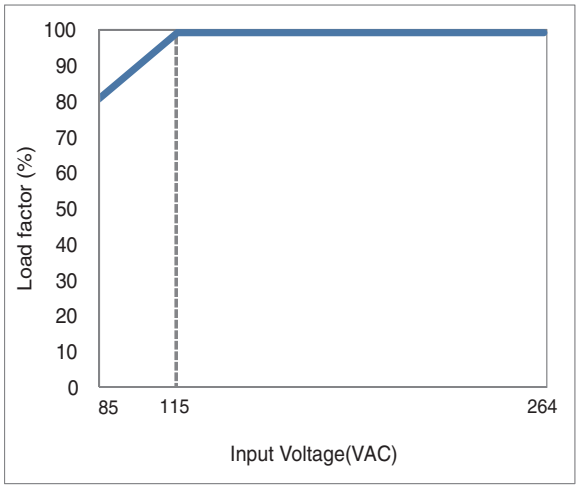



Fig.2 Derating curve depending on input voltage

■The ambient temperature should be measured 5 to 10 cm away from the power supply so that it won't be inluenced by the heat from the power supply.Please consult us for more details.

COSEL AC-DC Power Supplies Medical Type

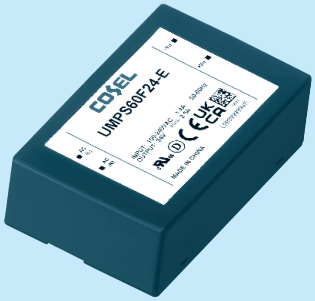
# UMPS60F

**Ordering information**

| UMP | S | 60 | F | □□ | -□ |
|---|---|---|---|---|---|
| ① | ② | ③ | ④ | ⑤ | ⑥ |

①Series name
②Single output
③Output wattage
④Universal input
⑤Output voltage
⑥Optional

RoHS




ClassII

*Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

| MODEL | UMPS60F05-E | UMPS60F12-E | UMPS60F24-E | UMPS60F48-E |
|---|---|---|---|---|
| MAX OUTPUT WATTAGE[W] | 30 | 54 | 60 | 60 |
| DC OUTPUT | 5V 6A | 12V 4.5A | 24V 2.5A | 48V 1.25A |

## SPECIFICATIONS

| | MODEL | | UMPS60F05-E | UMPS60F12-E | UMPS60F24-E | UMPS60F48-E |
|---|---|---|---|---|---|---|
| INPUT | VOLTAGE[V] | | AC85 - 264 1φ | | | |
| | CURRENT[A] | ACIN 115V | 0.7 | 1.4 | | |
| | | ACIN 230V | 0.3 | 0.7 | | |
| | FREQUENCY[Hz] | | 50/60 (47-63) | | | |
| | EFFICIENCY[%] | ACIN 115V | 80typ | 87typ | 88typ | 89typ |
| | | ACIN 230V | 80typ | 88typ | 90typ | 91typ |
| | INRUSH CURRENT[A] | ACIN 115V | 25typ | | | |
| | | ACIN 230V | 50typ | | | |
| | LEAKAGE CURRENT[uA] | ACIN 264V | 200max | | | |
| | TOUCH CURRENT[uA] | ACIN 264V | 75max | | | |
| OUTPUT | VOLTAGE[V] | | 5 | 12 | 24 | 48 |
| | CURRENT[A] | | 6 | 4.5 | 2.5 | 1.25 |
| | WATTAGE[W] | | 30 | 54 | 60 | 60 |
| | LINE REGULATION[mV] | *1 | 20max | 48max | 96max | 192max |
| | LOAD REGULATION[mV] | *1 | 100max | 120max | 150max | 240max |
| | RIPPLE NOISE [mVp-p] | *2 Io=100% | 150 (Bandwidth 20MHz) | | | |
| | TEMPERATURE REGULATION[mV] | 0~+40℃ | 100max | 120max | 240max | 480max |
| | START-UP TIME[ms] | ACIN 115V<br>ACIN 230V | 40typ | | | |
| | HOLD-UP TIME[ms] | ACIN 115V | 20typ | | | |
| | | ACIN 230V | 100typ | | | |
| | OUTPUT VOLTAGE SETTING[V] | | 4.90 to 5.30 | 11.50 to 12.50 | 23.00 to 25.00 | 46.00 to 50.00 |
| PROTECTION CIRCUIT AND OTHERS | OVERCURRENT PROTECTION [A] | | Works over 105% of rating and recovers automatically | | | |
| | OVERVOLTAGE PROTECTION[V] | | 5.75 to 7.00 | 13.80 to 16.80 | 27.60 to 33.60 | 55.20 to 67.20 |
| ISOLATION | INPUT-OUTPUT | | AC4,000V 1minute, DC500V 100MΩmin (At Room Temperature) 2MOPP | | | |
| ENVIRONMENT | OPERATING TEMP.,HUMID. | *3 | -20 to +70℃, 20 - 90%RH (Non condensing) | | | |
| | STORAGE TEMP.,HUMID. | | -20 to +75℃, 20 - 90%RH (Non condensing) | | | |
| | VIBRATION | | 10 - 55Hz, 19.6m/s² (2G) , 3minutes period, 60minutes each along X, Y and Z axis | | | |
| | IMPACT | | 196.1m/s² (20G) , 11ms, once each X, Y and Z axis | | | |
| SAFETY AND EMC | AGENCY APPROVALS | | UL62368-1, C-UL (equivalent to CAN/CSA-C22.2 No.62368-1), EN62368-1, ANSVAAMI ES60601-1, C-UL (equivalent to CAN/CSA-C22.2 No.60601-1), EN60601-1 3rd, Complies with IEC60335-1 | | | |
| | EMC EMISSON | | Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part 15-B, FCC Part 18-B | | | |
| | EMC EMMUNITY | | Complies with EN61000-4-2, 3, 4, 5, 6, 8, 11 | | | |
| | HARMONIC ATTENUATOR | *5 | Complies with IEC61000-3-2 (Class A) No built-in active PFC | | | |
| OTHERS | CASE SIZE/WEIGHT | | 55.9×30.5×81.3mm [2.2×1.2×3.2 inches] (W×H×D) / 200g max | | | |
| | COOLING METHOD | | Convection | | | |
| WARRANTY | WARRANTY | *4 | 5 years (subject to the operating conditions) | | | |

*1 Consult us about dynamic load and input response. Measure the output voltage by using the average mode of the tester to deal with the burst operation at low (Io=0~20%typ) load.
*2 This is the result of measurement of the testing board with capacitors of 47μF and 0.1μF placed at 50 mm from the output terminals by a 20MHz oscilloscope or a ripple-noise meter equivalent to Keisoku-GikenRM104.
When the load factor is low (Io=0~20%typ), the switching power loss is reduced by burst operation, which will cause ripple noise to go beyond the specifications.
*3 Output power derating is required. Refer to "Derating"
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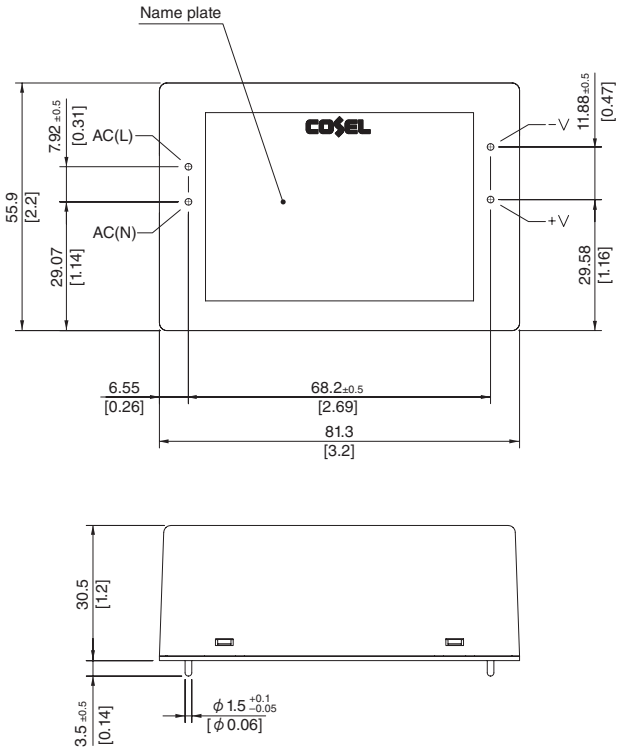
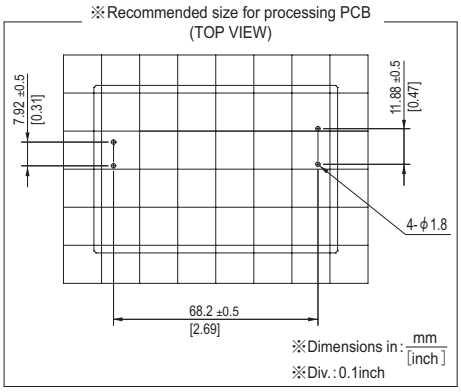
*5 Please contact us about another class. When two or more units are operating it may not comply with the IEC61000-3-2. Please contact us for details.
* All parameters not specially mentioned are measured at ACIN 230V, rated load and 25℃ of ambient temperature.
* Do not use the power supply in overcurrent conditions or in unspecified input voltage ranges. Otherwise the internal components may be damaged.
* Parallel operation is not possible with this model.
* Acoustic noise may be heard from the power supply when used for pulse load.

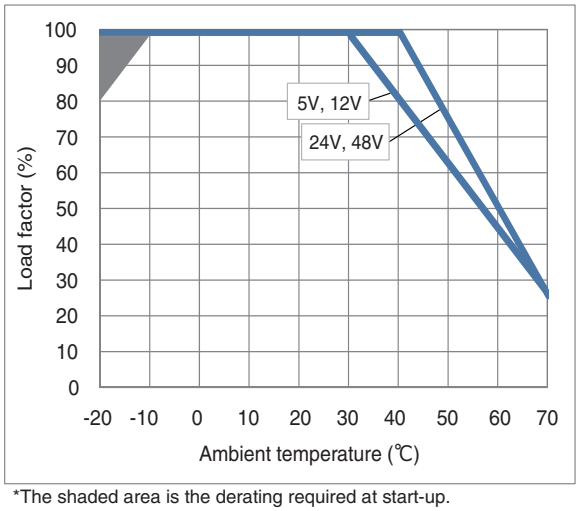
## External view




※ Dimensions in mm, [ ] = inches
※ Tolerance : ±1 [±0.04]
※ Weight : 200g max
※ Pin terminal material : Copper
※ Plating treatment of terminal : Lead free plating
※ Case material :PBT

## Derating Curve




*The shaded area is the derating required at start-up.

Fig.1 Derating curve depending on ambient temperature

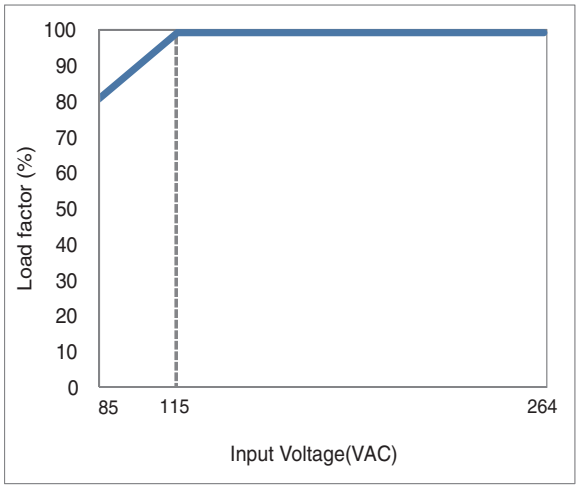
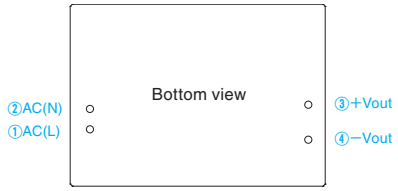



Fig.2 Derating curve depending on input voltage

■The ambient temperature should be measured 5 to 10 cm away from the power supply so that it won't be inluenced by the heat from the power supply.Please consult us for more details.

## Pin Configuration



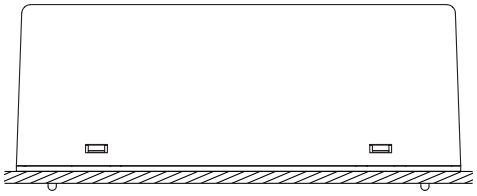

| No. | Pin connection | Function |
|---|---|---|
| ① | AC(L) | AC input |
| ② | AC(N) | |
| ③ | +Vout | +DC output |
| ④ | −Vout | −DC output |

## Implementation・Mounting Method

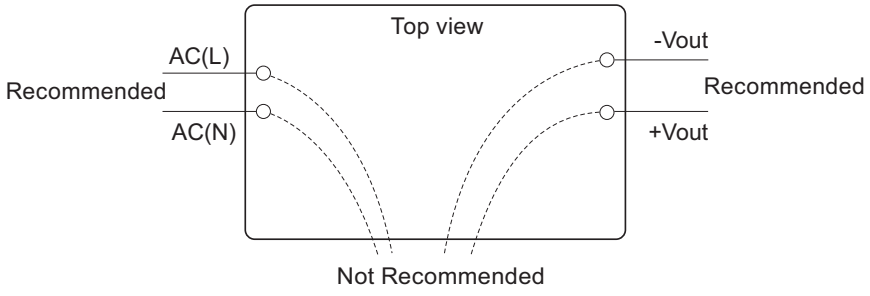
### Mounting method

■AC voltage exists on the primary side. Therefore, in order to prevent electric shock, or to meet the leakage current requirements of the safety standard, you need to secure an insulation distance of at least 5mm.

■When two or more power supplies are used side by side, position them with proper intervals to allow enough air ventilation. The temperature around each power supply should not exceed the temperature range shown in derating curve.



■Avoid placing the AC input line pattern layout underneath the unit.It will increase the line conducted noise. Make sure to leave an ample distance between the line pattern layout and the unit. Also avoid placing the DC output line pattern underneath the unit because it may increase the output noise. Lay out the pattern away from the unit.




### Soldering

■Flow soldering: 260℃ for up to 10 seconds.

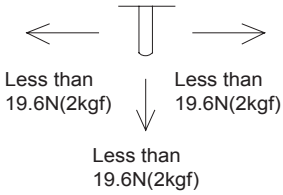
■Soldering iron (70W): 360℃ for up to 5 seconds.

### Stress to the pins

■Input/output pin are soldered to the PCB internally.Do not pull or push a lead powerfully.

■Applying excessive stress to the input or output pins of the unit may damage internal connections. Avoid applying stress in excess of that shown in the figure on the right.

■If it is expected that stress is applied to the input/output pin due to vibration or impact, reduce the stress to the pin by taking such measures as fixing the unit to the PCB by silicone rubber, etc.



## Instruction Manual

■Please read the “Instruction Manual” and “Before using our product” before you use our product.

Instruction Manual https://www.cosel.co.jp/redirect/en/UMPS/
Before using our product https://en.cosel.co.jp/technical/caution/index.html

UMPS NOTICE

## Basic Characteristics Data

| Model | Circuit method | Switching frequency [kHz] | Input current [A] | Rated input fuse | Inrush current protection circuit | PCB/Pattern | | | Parallel operation |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Material | Single sided | Double sided | |
| UMPS30F | Flyback converter | 20 to 125 | 0.7 | 250V 2.5A | Thermistor | CEM-3 | Yes | | No |
| UMPS60F | Flyback converter | 20 to 125 | 1.4 | 250V 2.5A | Thermistor | FR4 | | Yes | No |