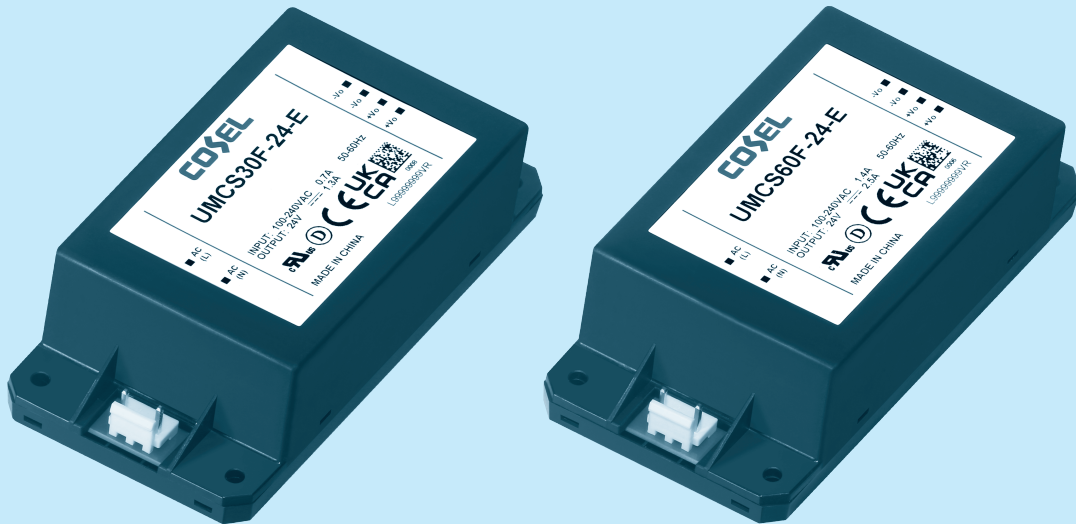




# UMCS-series



## 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

# UMCS30F

UMC S 30 F - -

① ② ③ ④ ⑤ ⑥



- ① Series name
- ② Single output
- ③ Output wattage
- ④ Universal input
- ⑤ Output voltage
- ⑥ Optional \*5  
T : Terminal block

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                 | UMCS30F-5-E | UMCS30F-12-E | UMCS30F-24-E | UMCS30F-48-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                           | UMCS30F-5-E                                                                                                                                                                      | UMCS30F-12-E   | UMCS30F-24-E   | UMCS30F-48-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          |
|                               |                                 | ACIN 230V                                                                                                                                                                        | 80typ          | 87typ          | 89typ          |
|                               | INRUSH CURRENT[A]               | ACIN 115V                                                                                                                                                                        | 25typ          |                |                |
|                               |                                 | ACIN 230V                                                                                                                                                                        | 50typ          |                |                |
| OUTPUT                        | LEAKAGE CURRENT[uA]             | ACIN 264V                                                                                                                                                                        | 200max         |                |                |
|                               | TOUCH CURRENT[uA]               | ACIN 264V                                                                                                                                                                        | 75max          |                |                |
|                               | 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 lo=100% | 150 (Bandwidth 20MHz)                                                                                                                                                            |                |                |                |
|                               | TEMPERATURE REGULATION[mV]      | 0~+45℃                                                                                                                                                                           | 100max         | 240max         | 480max         |
|                               | START-UP TIME[ms]               | ACIN 115V                                                                                                                                                                        | 40typ          |                |                |
|                               |                                 | ACIN 230V                                                                                                                                                                        |                |                |                |
|                               | HOLD-UP TIME[ms]                | ACIN 115V                                                                                                                                                                        | 20typ          |                |                |
|                               |                                 | ACIN 230V                                                                                                                                                                        | 100typ         |                |                |
| PROTECTION CIRCUIT AND OTHERS | OUTPUT VOLTAGE SETTING[V]       | 4.90 to 5.30                                                                                                                                                                     | 11.50 to 12.50 | 23.00 to 25.00 | 46.00 to 50.00 |
|                               | OVERCURRENT PROTECTION [A]      | Works over 105% of rating and recovers automatically                                                                                                                             |                |                |                |
| ISOLATION                     | OVERVOLTAGE PROTECTION[V]       | 5.75 to 7.00                                                                                                                                                                     | 13.80 to 16.80 | 27.60 to 33.60 | 55.20 to 67.20 |
|                               | 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/s <sup>2</sup> (2G) , 3minutes period, 60minutes each along X, Y and Z axis                                                                                     |                |                |                |
|                               | IMPACT                          | 196.1m/s <sup>2</sup> (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 EMISSION                    | Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part 15-B, FCC Part 18-B                                                                                           |                |                |                |
|                               | EMC IMMUNITY                    | Complies with EN61000-4-2, 3, 4, 5, 6, 8, 11                                                                                                                                     |                |                |                |
|                               | HARMONIC ATTENUATOR*6           | Complies with IEC61000-3-2 (Class A) No built-in active PFC                                                                                                                      |                |                |                |
| OTHERS                        | CASE SIZE/WEIGHT                | 55.9X35.7X109.2mm [2.2X1.4X4.3 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 (lo=0~20%typ) load.

\*2 This is the result of measurement of the testing board with capacitors of 47μF and 0.1μF placed at 150 mm from the output terminals by a 20MHz oscilloscope or a ripple-noise meter equivalent to Keisoku-GikenRM104.

When the load factor is low (lo=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 The listed option may affect the published standard specifications. Please contact us for detailed product specifications and safety approvals.

\*6 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.

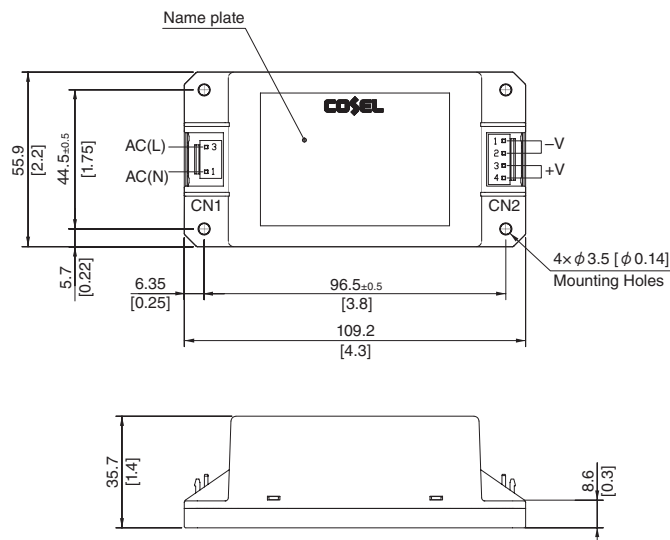
\* All parameters not specially mentioned are measured at ACIN 230V, rated load and 25℃ of ambient temperature.

\* 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



Mating connector and terminal of CN1, CN2

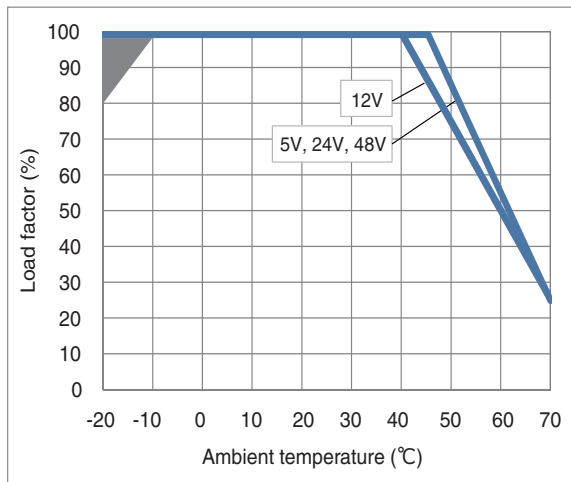
| I/O Connector | Mating Connector | Terminal                                           | Mfr.   |
|---------------|------------------|----------------------------------------------------|--------|
| CN1           | B2P3-VH          | Reel : SVH-21T-P1.1<br>Loose piece : BVH-21T-P1.1  | J.S.T. |
| CN2           | B4P-VH           | Chain : SVH-21T-P1.1<br>Loose piece : BVH-21T-P1.1 | J.S.T. |

<Pin Assignments>

| CN1     |       | CN2     |        |
|---------|-------|---------|--------|
| Pin No. | Input | Pin No. | Output |
| 1       | AC(N) | 1, 2    | -V     |
| 2       | AC(L) | 3, 4    | +V     |
| 3       |       |         |        |

- ※ Dimensions in mm, [ ] = inches
- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 200g max
- ※ Case material : PBT
- ※ Maximum current per contact at CN2 is 5A
- ※ Mounting torque : 0.49N·m max

## Derating Curve



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

Fig.1 Derating curve depending on ambient temperature

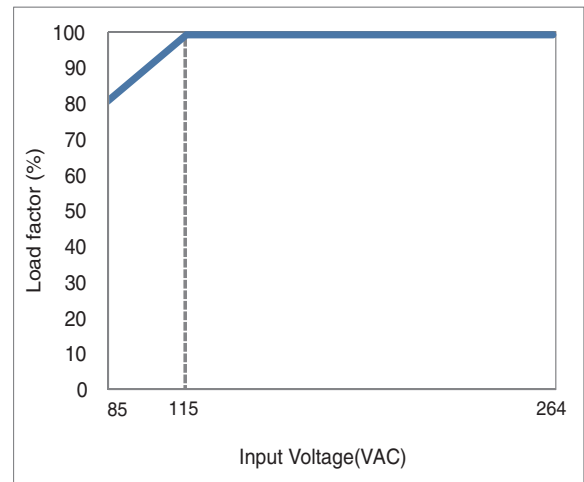


Fig.2 Derating curve depending on input voltage

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

# UMCS60F

UMC   S   60   F   -□   -□  
 ①   ②   ③   ④   ⑤   ⑥



- ① Series name
- ② Single output
- ③ Output wattage
- ④ Universal input
- ⑤ Output voltage
- ⑥ Optional \*5
- T : Terminal block

□ Class II

\*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                 | UMCS60F-5-E | UMCS60F-12-E | UMCS60F-24-E | UMCS60F-48-E |
|-----------------------|-------------|--------------|--------------|--------------|
| MAX OUTPUT WATTAGE[W] | 30          | 54           | 60           | 60           |
| DC OUTPUT             | 5V 6A       | 12V 4.5A     | 24V 2.5A     | 48V 1.25A    |

## SPECIFICATIONS

|                               | MODEL                           | UMCS60F-5-E                                                                                                                                                                      | UMCS60F-12-E   | UMCS60F-24-E   | UMCS60F-48-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          | 89typ          |
|                               |                                 | ACIN 230V                                                                                                                                                                        | 80typ          | 88typ          | 91typ          |
|                               | INRUSH CURRENT[A]               | ACIN 115V                                                                                                                                                                        | 25typ          |                |                |
|                               |                                 | ACIN 230V                                                                                                                                                                        | 50typ          |                |                |
| OUTPUT                        | LEAKAGE CURRENT[uA]             | ACIN 264V                                                                                                                                                                        | 200max         |                |                |
|                               | TOUCH CURRENT[uA]               | ACIN 264V                                                                                                                                                                        | 75max          |                |                |
|                               | 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 lo=100% | 150 (Bandwidth 20MHz)                                                                                                                                                            |                |                |                |
|                               | TEMPERATURE REGULATION[mV]      | 0~+40℃                                                                                                                                                                           | 100max         | 240max         | 480max         |
|                               | START-UP TIME[ms]               | ACIN 115V                                                                                                                                                                        | 40typ          |                |                |
|                               |                                 | ACIN 230V                                                                                                                                                                        |                |                |                |
|                               | HOLD-UP TIME[ms]                | ACIN 115V                                                                                                                                                                        | 20typ          |                |                |
|                               |                                 | ACIN 230V                                                                                                                                                                        | 100typ         |                |                |
| PROTECTION CIRCUIT AND OTHERS | OUTPUT VOLTAGE SETTING[V]       | 4.90 to 5.30                                                                                                                                                                     | 11.50 to 12.50 | 23.00 to 25.00 | 46.00 to 50.00 |
|                               | OVERCURRENT PROTECTION [A]      | Works over 105% of rating and recovers automatically                                                                                                                             |                |                |                |
| ISOLATION                     | OVERVOLTAGE PROTECTION[V]       | 5.75 to 7.00                                                                                                                                                                     | 13.80 to 16.80 | 27.60 to 33.60 | 55.20 to 67.20 |
|                               | INPUT-OUTPUT                    | AC4,000V 1minute, DC500V 100MΩ min (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/s <sup>2</sup> (2G) , 3minutes period, 60minutes each along X, Y and Z axis                                                                                     |                |                |                |
|                               | IMPACT                          | 196.1m/s <sup>2</sup> (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 EMISSION                    | Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part 15-B, FCC Part 18-B                                                                                           |                |                |                |
|                               | EMC IMMUNITY                    | Complies with EN61000-4-2, 3, 4, 5, 6, 8, 11                                                                                                                                     |                |                |                |
|                               | HARMONIC ATTENUATOR*6           | Complies with IEC61000-3-2 (Class A) No built-in active PFC                                                                                                                      |                |                |                |
| OTHERS                        | CASE SIZE/WEIGHT                | 55.9X35.7X109.2mm [2.2X1.4X4.3 inches] (W×H×D) / 230g 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 (lo=0~20%typ) load.

\*2 This is the result of measurement of the testing board with capacitors of 47μF and 0.1μF placed at 150 mm from the output terminals by a 20MHz oscilloscope or a ripple-noise meter equivalent to Keisoku-GikenRM104.

When the load factor is low (lo=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 The listed option may affect the published standard specifications. Please contact us for detailed product specifications and safety approvals.

\*6 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.

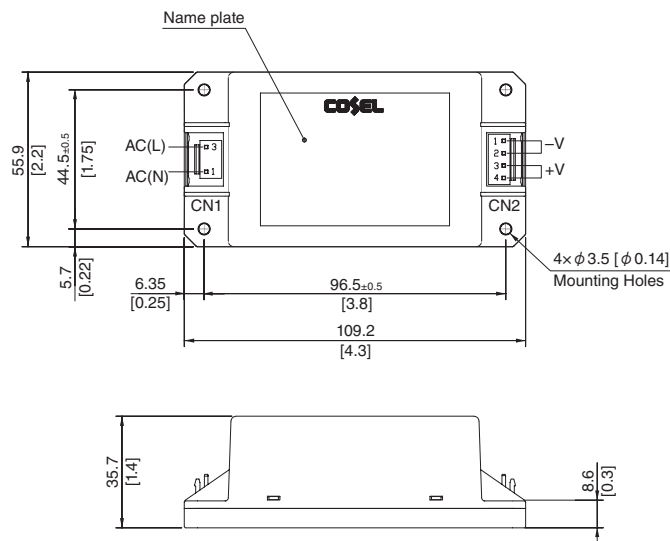
\* All parameters not specially mentioned are measured at ACIN 230V, rated load and 25℃ of ambient temperature.

\* 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



Mating connector and terminal of CN1, CN2

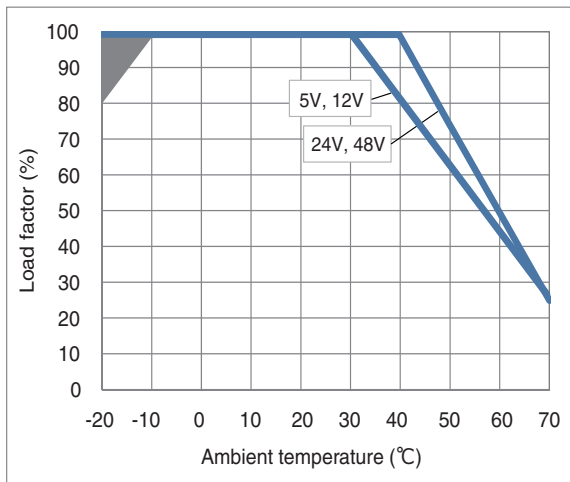
| I/O Connector | Mating Connector | Terminal                                           | Mfr.   |
|---------------|------------------|----------------------------------------------------|--------|
| CN1           | B2P3-VH          | Reel : SVH-21T-P1.1<br>Loose piece : BVH-21T-P1.1  | J.S.T. |
| CN2           | B4P-VH           | Chain : SVH-21T-P1.1<br>Loose piece : BVH-21T-P1.1 | J.S.T. |

<Pin Assignments>

| CN1     |       | CN2     |        |
|---------|-------|---------|--------|
| Pin No. | Input | Pin No. | Output |
| 1       | AC(N) | 1, 2    | -V     |
| 2       | AC(L) | 3, 4    | +V     |
| 3       |       |         |        |

- ※ Dimensions in mm, [ ] = inches
- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 230g max
- ※ Case material : PBT
- ※ Maximum current per contact at CN2 is 5A
- ※ Mounting torque : 0.49N·m max

## Derating Curve



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

Fig.1 Derating curve depending on ambient temperature

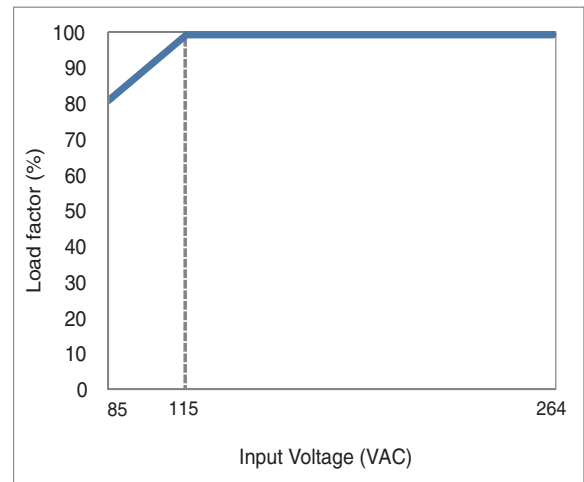
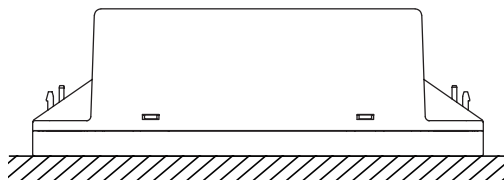


Fig.2 Derating curve depending on input voltage

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

## Assembling and Installation Method

■ When the power supply is used with natural convection cooling, the standard mounting position is horizontal.



Side view

■ 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.

## Instruction Manual

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

## 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 |                    |
| UMCS30F | Flyback converter | 20 to 125                 | 0.7               | 250V 2.5A        | Thermistor                        | CEM-3         | Yes          |              | No                 |
| UMCS60F | Flyback converter | 20 to 125                 | 1.4               | 250V 2.5A        | Thermistor                        | CEM-3/<br>FR4 | Yes          | Yes          | No                 |