

## Order Catalogue 2013 / 2014





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For the Switching Model Power Supply

# Switching Mode Power Supply



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**ORDERING INFORMATION****MSF15-05**

Series name

Total output wattage

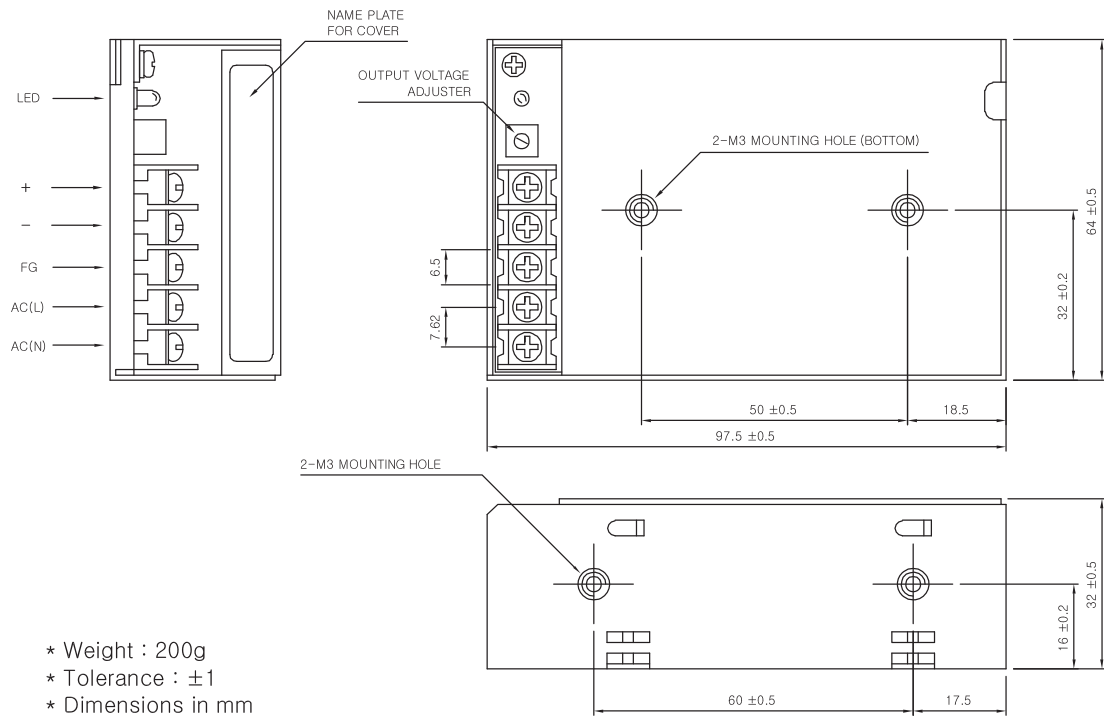
Output voltage combination

- Approved by UL/C-UL, CE
- Over current protection
- Over voltage protection
- Complies with FCC Part15 and EN55022 Class A Limits
- Remote on/off Control (MSF300)
- Remote sensing (MSF150~300)
- Monitor Signal (MSF300)
- 3 years warranty

**MSF15-S SPECIFICATIONS**

|                       | MODEL                          | MSF15-3R3                                                                                             | MSF15-05      | MSF15-09     | MSF15-12     | MSF15-15     | MSF15-24     |
|-----------------------|--------------------------------|-------------------------------------------------------------------------------------------------------|---------------|--------------|--------------|--------------|--------------|
| INPUT                 | VOLTAGE, FREQUENCY             | AC100-240V (AC85 ~ 264V or DC120 ~ 370V), 50/60Hz (47 ~ 440Hz) Universal Input.                       |               |              |              |              |              |
|                       | CURRENT [V]                    | 110V                                                                                                  | 0.4 (10=100%) |              |              |              |              |
|                       |                                | 220V                                                                                                  | 0.2 (10=100%) |              |              |              |              |
|                       | EFFICIENCY [%]                 | 110V                                                                                                  | 67 typ        | 67 typ       | 71 typ       | 73 typ       | 75 typ       |
|                       |                                | 220V                                                                                                  |               |              |              |              | 78 typ       |
|                       | INRUSH CURRENT                 | 20A typ (AC IN 110V, I <sub>c</sub> =100%), 40A typ (AC IN 220V, I <sub>c</sub> =100%) at cold start. |               |              |              |              |              |
| OUTPUT                | VOLTAGE [V]                    | 3.3                                                                                                   | 5             | 9            | 12           | 15           | 24           |
|                       | CURRENT [A]                    | 3                                                                                                     | 3             | 1.67         | 1.25         | 1            | 0.62         |
|                       | REGULATION, LINE [mV]          | 25 Max                                                                                                | 25 Max        | 45 Max       | 60 Max       | 75 Max       | 120 Max      |
|                       | REGULATION, LOAD [mV]          | 50 Max                                                                                                | 50 Max        | 90 Max       | 120 Max      | 150 Max      | 240 Max      |
|                       | RIPPLE [mVp-p]                 | 35 Max                                                                                                | 50 Max        | 90 Max       | 120 Max      | 150 Max      | 240 Max      |
|                       | RIPPLE, NOISE [mVp-p]          | 85 Max                                                                                                | 100 Max       | 140 Max      | 170 Max      | 200 Max      | 290 Max      |
|                       | TEMPERATURE DRIFT 0~+50°C [mV] | 85 Max                                                                                                | 90 Max        | 162 Max      | 216 Max      | 270 Max      | 432 Max      |
|                       | RISE TIME [ms]                 | 500 max (AC IN 110V, I <sub>c</sub> =100%)                                                            |               |              |              |              |              |
|                       | HOLDING TIME [ms]              | 20 typ (AC IN 110V, I <sub>c</sub> =100%)                                                             |               |              |              |              |              |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION        | Works at over 110% of rating and recovers automatically                                               |               |              |              |              |              |
|                       | OVER VOLTAGE PROTECTION        | Works at over 115% of rating (by zener diode clamping)                                                |               |              |              |              |              |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT                   | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                       |               |              |              |              |              |
|                       | INPUT-CASE, FG                 | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                       |               |              |              |              |              |
|                       | OUTPUT-CASE, FG                | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                        |               |              |              |              |              |
| ENVIRONMENT           | OPERATING TEMP AND HUMID       | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                              |               |              |              |              |              |
|                       | STORAGE TEMP AND HUMID         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                              |               |              |              |              |              |
|                       | VIBRATION                      | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                   |               |              |              |              |              |
|                       | IMPACT                         | 10G for 20ms once on each X, Y and Z axis                                                             |               |              |              |              |              |
| SAFETY                | SAFETY REGULATION              | —                                                                                                     | UL, C-UL, CE  | UL, C-UL, CE | UL, C-UL, CE | UL, C-UL, CE | UL, C-UL, CE |
|                       | LINE CONDUCTED RF VOLTAGE      | Complied with FCC Part15 and EN55022 Class A Limits                                                   |               |              |              |              |              |

## MSF15-S EXTERNAL VIEW



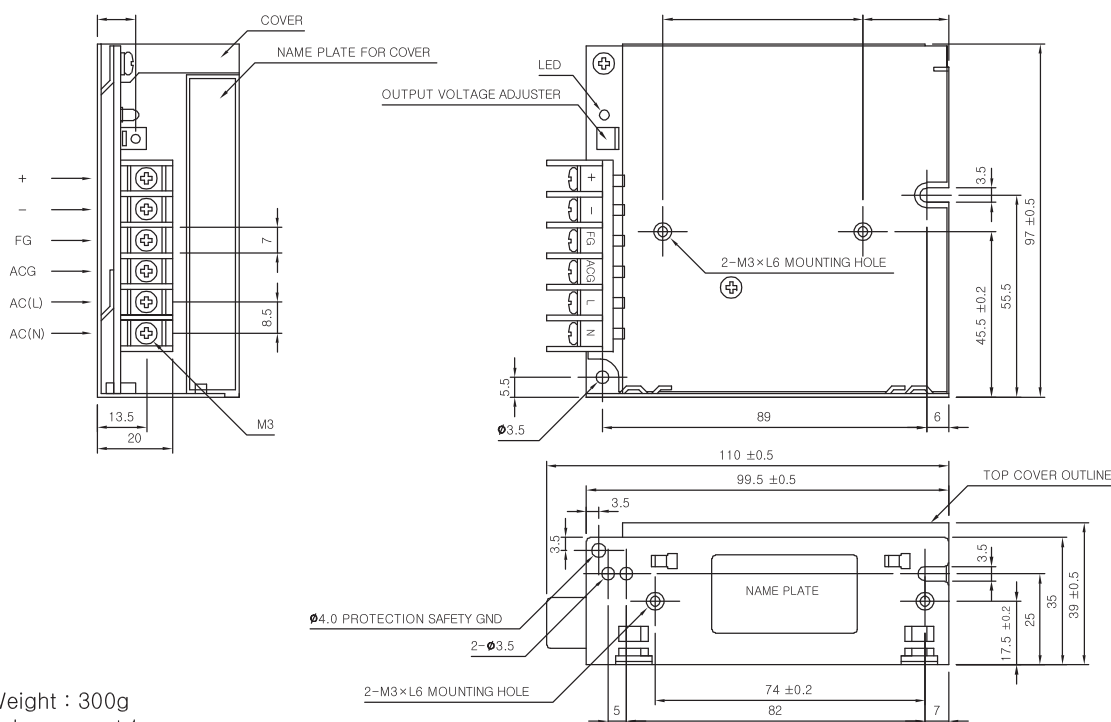
- \* Weight : 200g
- \* Tolerance :  $\pm 1$
- \* Dimensions in mm

## MSF25-S SPECIFICATIONS



|                       | MODEL                          |                                            | MSF25-3R3                                                                                                   | MSF25-05   | MSF25-09   | MSF25-12   | MSF25-15   | MSF25-24   | MSF25-48   |
|-----------------------|--------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------|------------|------------|------------|------------|------------|------------|
| INPUT                 | VOLTAGE, FREQUENCY             |                                            | AC100-240V (AC85 ~ 264V or DC125 ~ 370V), 50/60Hz (47 ~ 440Hz) Universal Input.                             |            |            |            |            |            |            |
|                       | CURRENT [V]                    | 110V                                       | 0.6 (I <sub>o</sub> =100%)                                                                                  |            |            |            |            |            |            |
|                       |                                | 220V                                       | 0.3 (I <sub>o</sub> =100%)                                                                                  |            |            |            |            |            |            |
|                       | EFFICIENCY [%]                 | 110V                                       | 60 typ                                                                                                      | 70 typ     | 70 typ     | 75 typ     | 75 typ     | 75 typ     | 70 typ     |
|                       |                                | 220V                                       |                                                                                                             |            |            |            |            |            |            |
| INRUSH CURRENT        |                                |                                            | 20A typ (ACIN 110V, I <sub>o</sub> =100%), 40A typ(ACIN 220, I <sub>o</sub> =100%) Ta=(25°C of cold start). |            |            |            |            |            |            |
| OUTPUT                | VOLTAGE [V]                    | 3.3                                        | 5                                                                                                           | 9          | 12         | 15         | 24         | 48         |            |
|                       | CURRENT [A]                    | 5                                          | 5                                                                                                           | 2.7        | 2          | 1.6        | 1          | 0.5        |            |
|                       | REGULATION, LINE [mV]          | 25 Max                                     | 25 Max                                                                                                      | 45 Max     | 60 Max     | 75 Max     | 120 Max    | 240 Max    |            |
|                       | REGULATION, LOAD [mV]          | 50 Max                                     | 50 Max                                                                                                      | 90 Max     | 120 Max    | 150 Max    | 240 Max    | 480 Max    |            |
|                       | RIPPLE [mVp-p]                 | 50 Max                                     | 50 Max                                                                                                      | 90 Max     | 120 Max    | 150 Max    | 240 Max    | 480 Max    |            |
|                       | RIPPLE, NOISE [mVp-p]          | 100 Max                                    | 100 Max                                                                                                     | 140 Max    | 170 Max    | 200 Max    | 290 Max    | 530 Max    |            |
|                       | TEMPERATURE DRIFT 0~+50°C [mV] | 50 Max                                     | 75 Max                                                                                                      | 135 Max    | 180 Max    | 225 Max    | 360 Max    | 720 Max    |            |
|                       | RISE TIME [ms]                 | 500 max (AC IN 110V, I <sub>o</sub> =100%) |                                                                                                             |            |            |            |            |            |            |
|                       | HOLDING TIME [ms]              | 20 typ (AC IN 110V, I <sub>o</sub> =100%)  |                                                                                                             |            |            |            |            |            |            |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION        |                                            | Works at over 110% of rating and recovers automatically                                                     |            |            |            |            |            |            |
|                       | OVER VOLTAGE PROTECTION        |                                            | Works at 115 ~ 140% of rating (In the case of 3.3V, it is 115 ~ 160%)                                       |            |            |            |            |            |            |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT                   |                                            | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                             |            |            |            |            |            |            |
|                       | INPUT-CASE, FG                 |                                            | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                             |            |            |            |            |            |            |
|                       | OUTPUT-CASE, FG                |                                            | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                              |            |            |            |            |            |            |
| ENVIRONMENT           | OPERATING TEMP AND HUMID       |                                            | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                                    |            |            |            |            |            |            |
|                       | STORAGE TEMPAND HUMID          |                                            | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                                    |            |            |            |            |            |            |
|                       | VIBRATION                      |                                            | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                         |            |            |            |            |            |            |
|                       | IMPACT                         |                                            | 10G for 20ms once on each X, Y and Z axis                                                                   |            |            |            |            |            |            |
| SAFETY                | SAFETY REGULATION              |                                            | UL,C-UL,CE                                                                                                  | UL,C-UL,CE | UL,C-UL,CE | UL,C-UL,CE | UL,C-UL,CE | UL,C-UL,CE | UL,C-UL,CE |
|                       | LINE CONDUCTED RF VOLTAGE      |                                            | Complied with FCC Part15 and EN55022 Class A Limits                                                         |            |            |            |            |            |            |

## MSF25-S EXTERNAL VIEW



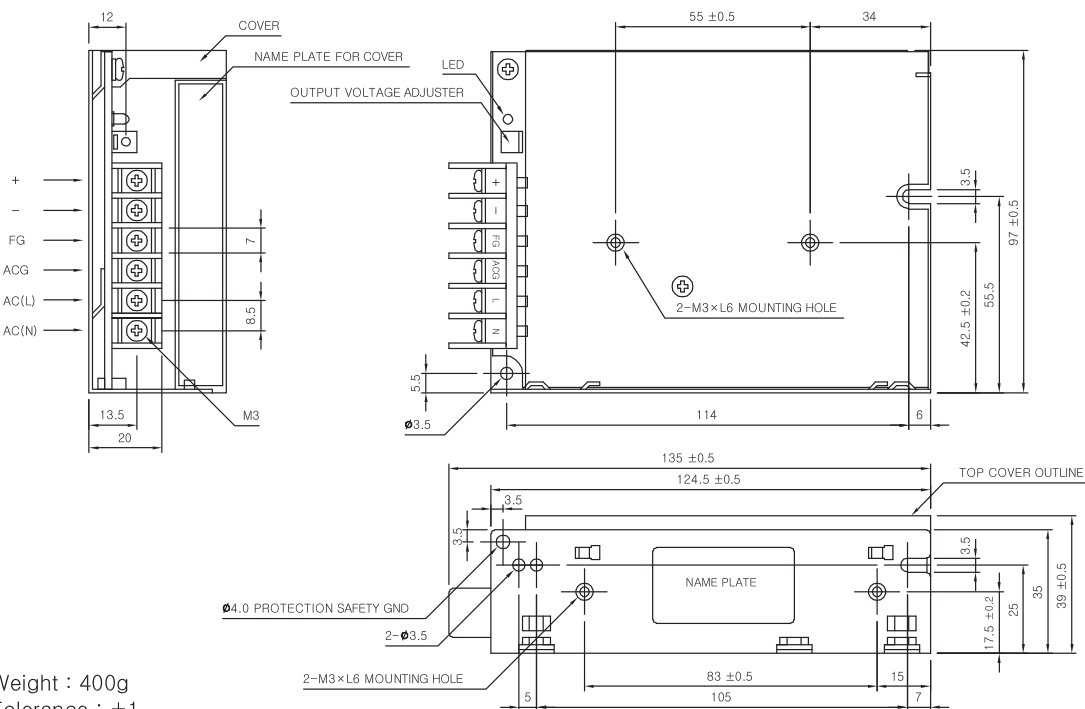
- \* Weight : 300g
- \* Tolerance :  $\pm 1$
- \* Dimensions in mm

## MSF35-S SPECIFICATIONS



|                       | MODEL                          | MSF35-3R3                                                                                                      | MSF35-05                   | MSF35-09 | MSF35-12   | MSF35-15   | MSF35-24   | MSF35-48   |
|-----------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------|----------|------------|------------|------------|------------|
| INPUT                 | VOLTAGE, FREQUENCY             | AC100-240V (AC85 ~ 264V or DC125 ~ 370V), 50/60Hz (47 ~ 440Hz) Universal Input.                                |                            |          |            |            |            |            |
|                       | CURRENT [V]                    | 110V                                                                                                           | 0.8 (I <sub>o</sub> =100%) |          |            |            |            |            |
|                       |                                | 220V                                                                                                           | 0.4 (I <sub>o</sub> =100%) |          |            |            |            |            |
|                       | EFFICIENCY [%]                 | 110V                                                                                                           | 60 typ                     | 70 typ   | 70 typ     | 75 typ     | 75 typ     | 75 typ     |
|                       |                                | 220V                                                                                                           | 60 typ                     | 70 typ   | 70 typ     | 75 typ     | 75 typ     | 75 typ     |
| OUTPUT                | INRUSH CURRENT                 | 20A typ (AC IN 110V, I <sub>o</sub> =100%), 40A typ(AC IN 220V, I <sub>o</sub> =100%) Ta=(25°C of cold start). |                            |          |            |            |            |            |
|                       | VOLTAGE [V]                    | 3.3                                                                                                            | 5                          | 9        | 12         | 15         | 24         | 48         |
|                       | CURRENT [A]                    | 7                                                                                                              | 7                          | 3.9      | 3          | 2.4        | 1.5        | 0.75       |
|                       | REGULATION, LINE [mV]          | 25 Max                                                                                                         | 25 Max                     | 45 Max   | 60 Max     | 75 Max     | 120 Max    | 240 Max    |
|                       | REGULATION, LOAD [mV]          | 50 Max                                                                                                         | 50 Max                     | 90 Max   | 120 Max    | 150 Max    | 240 Max    | 480 Max    |
|                       | RIPPLE [mVp-p]                 | 80 Max                                                                                                         | 80 Max                     | 90 Max   | 120 Max    | 150 Max    | 240 Max    | 480 Max    |
|                       | RIPPLE, NOISE [mVp-p]          | 120 Max                                                                                                        | 120 Max                    | 140 Max  | 170 Max    | 200 Max    | 290 Max    | 530 Max    |
|                       | TEMPERATURE DRIFT 0~+50°C [mV] | 75 Max                                                                                                         | 75 Max                     | 135 Max  | 180 Max    | 225 Max    | 360 Max    | 720 Max    |
|                       | RISE TIME [ms]                 | 1500 max (AC IN 110V, I <sub>o</sub> =100%)                                                                    |                            |          |            |            |            |            |
|                       | HOLDING TIME [ms]              | 16 typ (AC IN 110V, I <sub>o</sub> =100%)                                                                      |                            |          |            |            |            |            |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION        | Works at over 110% of rating and recovers automatically                                                        |                            |          |            |            |            |            |
|                       | OVER VOLTAGE PROTECTION        | Works at 115 ~ 140% of rating (In the case of 3.3V, it is 115~160%)                                            |                            |          |            |            |            |            |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT                   | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                                |                            |          |            |            |            |            |
|                       | INPUT-CASE, FG                 | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                                |                            |          |            |            |            |            |
|                       | OUTPUT-CASE, FG                | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                                 |                            |          |            |            |            |            |
| ENVIRONMENT           | OPERATING TEMP AND HUMID       | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                                       |                            |          |            |            |            |            |
|                       | STORAGE TEMPAND HUMID          | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                                       |                            |          |            |            |            |            |
|                       | VIBRATION                      | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                            |                            |          |            |            |            |            |
|                       | IMPACT                         | 10G for 20ms once on each X, Y and Z axis                                                                      |                            |          |            |            |            |            |
| SAFETY                | SAFETY REGULATION              | UL,C-UL,CE                                                                                                     | UL,C-UL,CE                 | —        | UL,C-UL,CE | UL,C-UL,CE | UL,C-UL,CE | UL,C-UL,CE |
|                       | LINE CONDUCTED RF VOLTAGE      | Complied with FCC Part15 and EN55022 Class A Limits                                                            |                            |          |            |            |            |            |

## MSF35-S EXTERNAL VIEW



- \* Weight : 400g
- \* Tolerance : ±1
- \* Dimensions in mm

## MSF50-S SPECIFICATIONS



|                       | MODEL                     |         | MSF50-3R3                                                                                         | MSF50-05                   | MSF50-09   | MSF50-12   | MSF50-15   | MSF50-24   | MSF50-48   |        |
|-----------------------|---------------------------|---------|---------------------------------------------------------------------------------------------------|----------------------------|------------|------------|------------|------------|------------|--------|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-240V (AC85 ~ 264V or DC125 ~ 370V), 50/60Hz (47 ~ 440Hz) Universal Input.                   |                            |            |            |            |            |            |        |
|                       | CURRENT                   | [A]     | 110V                                                                                              | 1.4 (I <sub>o</sub> =100%) |            |            |            |            |            |        |
|                       |                           |         | 220V                                                                                              | 0.7 (I <sub>o</sub> =100%) |            |            |            |            |            |        |
|                       | EFFICIENCY                | [%]     | 110V                                                                                              | 63 typ                     | 70 typ     | 73 typ     | 75 typ     | 75 typ     | 78 typ     | 80 typ |
|                       |                           |         | 220V                                                                                              |                            |            |            |            |            |            |        |
| INRUSH CURRENT        |                           |         | 20A typ(ACIN 110V, I <sub>o</sub> =100%), 40A typ(ACIN 220V, I <sub>o</sub> =100%) at cold start. |                            |            |            |            |            |            |        |
| OUTPUT                | VOLTAGE                   | [V]     | 3.3                                                                                               | 5                          | 9          | 12         | 15         | 24         | 48         |        |
|                       | CURRENT                   | [A]     | 10                                                                                                | 10                         | 5.5        | 4.2        | 3.4        | 2.1        | 1          |        |
|                       | REGULATION, LINE          | [mV]    | 25 Max                                                                                            | 25 Max                     | 45 Max     | 60 Max     | 75 Max     | 120 Max    | 240 Max    |        |
|                       | REGULATION, LOAD          | [mV]    | 50 Max                                                                                            | 50 Max                     | 90 Max     | 120 Max    | 150 Max    | 240 Max    | 480 Max    |        |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                            | 50 Max                     | 90 Max     | 120 Max    | 150 Max    | 240 Max    | 480 Max    |        |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                           | 100 Max                    | 140 Max    | 170 Max    | 200 Max    | 290 Max    | 530 Max    |        |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 50 Max                                                                                            | 75 Max                     | 135 Max    | 180 Max    | 225 Max    | 360 Max    | 720 Max    |        |
|                       | RISE TIME                 | [ms]    | 1000 max (AC IN 110V, I <sub>o</sub> =100%)                                                       |                            |            |            |            |            |            |        |
|                       | HOLDING TIME              | [ms]    | 16 typ (AC IN 110V, I <sub>o</sub> =100%)                                                         |                            |            |            |            |            |            |        |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                           |                            |            |            |            |            |            |        |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating (In the case of 3.3V, it is 115 ~ 160%)                             |                            |            |            |            |            |            |        |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                   |                            |            |            |            |            |            |        |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                   |                            |            |            |            |            |            |        |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                    |                            |            |            |            |            |            |        |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                          |                            |            |            |            |            |            |        |
|                       | STORAGE TEMPAND HUMID     |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                          |                            |            |            |            |            |            |        |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                               |                            |            |            |            |            |            |        |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                         |                            |            |            |            |            |            |        |
| SAFETY                | SAFETY REGULATION         |         | UL,C-UL,CE                                                                                        | UL,C-UL,CE                 | UL,C-UL,CE | UL,C-UL,CE | UL,C-UL,CE | UL,C-UL,CE | UL,C-UL,CE |        |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                               |                            |            |            |            |            |            |        |

## MSF60-S SPECIFICATIONS



|                       | MODEL                     |         | MSF60-3R3                                                                                          | MSF60-05                     | MSF60-09   | MSF60-12   | MSF60-15   | MSF60-24   | MSF60-48   |        |
|-----------------------|---------------------------|---------|----------------------------------------------------------------------------------------------------|------------------------------|------------|------------|------------|------------|------------|--------|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-240V (AC85 ~ 264V or DC125 ~ 370V), 50/60Hz (47 ~ 440Hz) Universal Input.                    |                              |            |            |            |            |            |        |
|                       | CURRENT                   | [A]     | 110V                                                                                               | 1.7 ( I <sub>o</sub> =100%)  |            |            |            |            |            |        |
|                       |                           |         | 220V                                                                                               | 0.85 ( I <sub>o</sub> =100%) |            |            |            |            |            |        |
|                       | EFFICIENCY                | [%]     | 110V                                                                                               | 67 typ                       | 72 typ     | 75 typ     | 78 typ     | 78 typ     | 80 typ     | 80 typ |
|                       |                           |         | 220V                                                                                               |                              |            |            |            |            |            |        |
| INRUSH CURRENT        |                           |         | 20A typ(ACIN 110V, I <sub>o</sub> =100%), 40A typ(ACIN 220V, I <sub>o</sub> =100%) at cold start). |                              |            |            |            |            |            |        |
| OUTPUT                | VOLTAGE                   | [V]     | 3.3                                                                                                | 5                            | 9          | 12         | 15         | 24         | 48         |        |
|                       | CURRENT                   | [A]     | 12                                                                                                 | 12                           | 6.6        | 5          | 4          | 2.5        | 1.3        |        |
|                       | REGULATION, LINE          | [mV]    | 25 Max                                                                                             | 25 Max                       | 45 Max     | 60 Max     | 75 Max     | 120 Max    | 240 Max    |        |
|                       | REGULATION, LOAD          | [mV]    | 50 Max                                                                                             | 50 Max                       | 90 Max     | 120 Max    | 150 Max    | 240 Max    | 480 Max    |        |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                             | 50 Max                       | 90 Max     | 120 Max    | 150 Max    | 240 Max    | 480 Max    |        |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                            | 100 Max                      | 140 Max    | 170 Max    | 200 Max    | 290 Max    | 530 Max    |        |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 50 Max                                                                                             | 75 Max                       | 135 Max    | 180 Max    | 225 Max    | 360 Max    | 720 Max    |        |
|                       | RISE TIME                 | [ms]    | 1000 max (AC IN 110V, I <sub>o</sub> =100%)                                                        |                              |            |            |            |            |            |        |
|                       | HOLDING TIME              | [ms]    | 16 typ (AC IN 110V, I <sub>o</sub> =100%)                                                          |                              |            |            |            |            |            |        |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                            |                              |            |            |            |            |            |        |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating (In the case of 3.3V, it is 115 ~ 160%)                              |                              |            |            |            |            |            |        |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                    |                              |            |            |            |            |            |        |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                    |                              |            |            |            |            |            |        |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                     |                              |            |            |            |            |            |        |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                           |                              |            |            |            |            |            |        |
|                       | STORAGE TEMPAND HUMID     |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                           |                              |            |            |            |            |            |        |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                |                              |            |            |            |            |            |        |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                          |                              |            |            |            |            |            |        |
| SAFETY                | SAFETY REGULATION         |         | UL,C-UL,CE                                                                                         | UL,C-UL,CE                   | UL,C-UL,CE | UL,C-UL,CE | UL,C-UL,CE | UL,C-UL,CE | UL,C-UL,CE |        |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                |                              |            |            |            |            |            |        |

## MSF80-S SPECIFICATIONS



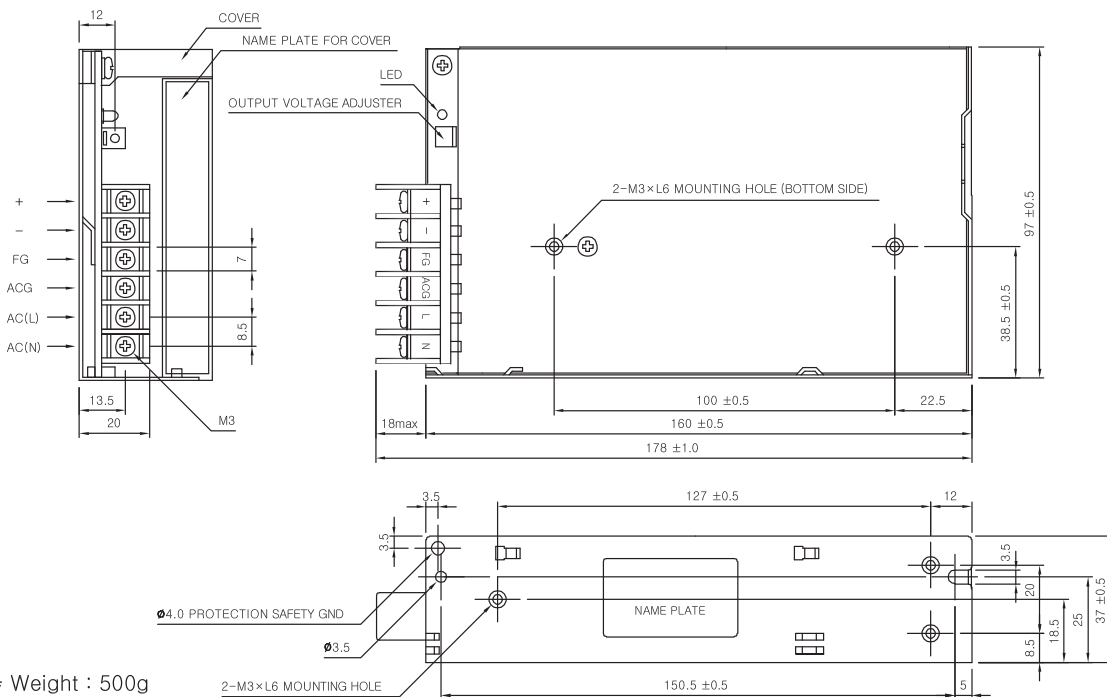
|                       | MODEL                     |         | MSF80-3R3                                                                                               | MSF80-05                    | MSF80-09     | MSF80-12     | MSF80-15     |        |
|-----------------------|---------------------------|---------|---------------------------------------------------------------------------------------------------------|-----------------------------|--------------|--------------|--------------|--------|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-120V / 200-240V (AC90 ~ 132V / 180 ~ 264V or DC240 ~ 370V), 50/60Hz (47 ~ 440Hz) User Selectable. |                             |              |              |              |        |
|                       | CURRENT                   | [A]     | 110V                                                                                                    | 2.5 ( I <sub>o</sub> =100%) |              |              |              |        |
|                       |                           | 220V    | 1.4 ( I <sub>o</sub> =100%)                                                                             |                             |              |              |              |        |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                    | 70 typ                      | 80 typ       | 81 typ       | 81 typ       | 81 typ |
|                       |                           |         | 220V                                                                                                    |                             |              |              |              |        |
| INRUSH CURRENT        |                           |         | 20A typ (AC IN 110V, I <sub>o</sub> =100%), 40A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start.    |                             |              |              |              |        |
| OUTPUT                | VOLTAGE                   | [V]     | 3.3                                                                                                     | 5                           | 9            | 12           | 15           |        |
|                       | CURRENT                   | [A]     | 20                                                                                                      | 20                          | 11.1         | 8.3          | 6.7          |        |
|                       | REGULATION, LINE          | [mV]    | 25 Max                                                                                                  | 25 Max                      | 45 Max       | 60 Max       | 75 Max       |        |
|                       | REGULATION, LOAD          | [mV]    | 50 Max                                                                                                  | 50 Max                      | 90 Max       | 120 Max      | 150 Max      |        |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                                  | 50 Max                      | 90 Max       | 120 Max      | 150 Max      |        |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                                 | 100 Max                     | 140 Max      | 170 Max      | 200 Max      |        |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 50 Max                                                                                                  | 75 Max                      | 135 Max      | 180 Max      | 225 Max      |        |
|                       | RISE TIME                 | [ms]    | 500 max (AC IN 110V, I <sub>o</sub> =100%)                                                              |                             |              |              |              |        |
| HOLDING TIME          |                           | [ms]    | 16 typ (AC IN 110V, I <sub>o</sub> =100%)                                                               |                             |              |              |              |        |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                                 |                             |              |              |              |        |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating                                                                           |                             |              |              |              |        |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |              |              |              |        |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |              |              |              |        |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                          |                             |              |              |              |        |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | 0 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                                  |                             |              |              |              |        |
|                       | STORAGE TEMPAND HUMID     |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                                |                             |              |              |              |        |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                     |                             |              |              |              |        |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                               |                             |              |              |              |        |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                            | UL, C-UL, CE                | UL, C-UL, CE | UL, C-UL, CE | UL, C-UL, CE |        |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                     |                             |              |              |              |        |

## MSF80-S SPECIFICATIONS



|                       | MODEL                     |         | MSF80-24                                                                                              | MSF80-28     | MSF80-36     | MSF80-48     |        |
|-----------------------|---------------------------|---------|-------------------------------------------------------------------------------------------------------|--------------|--------------|--------------|--------|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-120V / 200-240V (AC90 ~ 132V / 180 ~ 264V or DC240 ~ 370V), 50/60Hz (47~440Hz) User Selectable. |              |              |              |        |
|                       | CURRENT                   | [A]     | 2.5 ( I <sub>o</sub> =100%)                                                                           |              |              |              |        |
|                       |                           | 220V    | 1.4 ( I <sub>o</sub> =100%)                                                                           |              |              |              |        |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                  | 82 typ       | 82 typ       | 82 typ       | 82 typ |
|                       |                           |         | 220V                                                                                                  |              |              |              |        |
| INRUSH CURRENT        |                           |         | 20A typ(AC IN 110V, I <sub>o</sub> =100%), 40A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start.   |              |              |              |        |
| OUTPUT                | VOLTAGE                   | [V]     | 24                                                                                                    | 28           | 36           | 48           |        |
|                       | CURRENT                   | [A]     | 4.2                                                                                                   | 3.5          | 2.8          | 2.1          |        |
|                       | REGULATION, LINE          | [mV]    | 120 Max                                                                                               | 140 Max      | 180 Max      | 240 Max      |        |
|                       | REGULATION, LOAD          | [mV]    | 240 Max                                                                                               | 280 Max      | 360 Max      | 480 Max      |        |
|                       | RIPPLE                    | [mVp-p] | 240 Max                                                                                               | 280 Max      | 360 Max      | 480 Max      |        |
|                       | RIPPLE, NOISE             | [mVp-p] | 290 Max                                                                                               | 330 Max      | 410 Max      | 530 Max      |        |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 360 Max                                                                                               | 420 Max      | 540 Max      | 720 Max      |        |
|                       | RISE TIME                 | [ms]    | 500 max (AC IN 110V, I <sub>o</sub> =100%)                                                            |              |              |              |        |
|                       | HOLDING TIME              | [ms]    | 16 typ (AC IN 110V, I <sub>o</sub> =100%)                                                             |              |              |              |        |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                               |              |              |              |        |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating                                                                         |              |              |              |        |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                        |              |              |              |        |
|                       | INPUT-CASE, FG            |         | AC2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                        |              |              |              |        |
|                       | OUTPUT-CASE, FG           |         | AC500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                         |              |              |              |        |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | 0 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                                |              |              |              |        |
|                       | STORAGE TEMP AND HUMID    |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                              |              |              |              |        |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                   |              |              |              |        |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                             |              |              |              |        |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                          | UL, C-UL, CE | UL, C-UL, CE | UL, C-UL, CE |        |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                   |              |              |              |        |

## MSF50, 60, 80-S EXTERNAL VIEW



- \* Weight : 500g
- \* Tolerance :  $\pm 1$
- \* Dimensions in mm

## MSF100-S SPECIFICATIONS



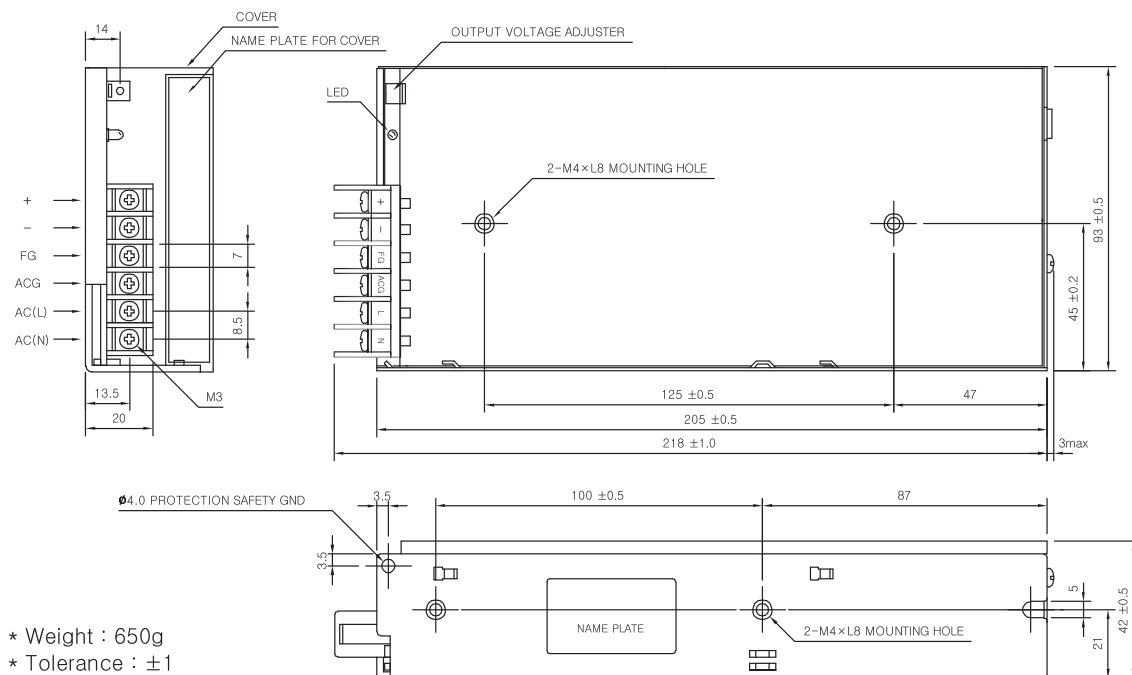
|                       | MODEL                     |         | MSF100-3R3                                                                                              | MSF100-05                   | MSF100-09    | MSF100-12    | MSF100-15    |        |
|-----------------------|---------------------------|---------|---------------------------------------------------------------------------------------------------------|-----------------------------|--------------|--------------|--------------|--------|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-120V / 200-240V (AC85 ~ 132V / 170 ~ 264V or DC240 ~ 370V), 50/60Hz (47 ~ 440Hz) User Selectable. |                             |              |              |              |        |
|                       | CURRENT                   | [A]     | 110V                                                                                                    | 2.5 ( I <sub>o</sub> =100%) |              |              |              |        |
|                       |                           |         | 220V                                                                                                    | 1.4 ( I <sub>o</sub> =100%) |              |              |              |        |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                    | 70 typ                      | 80 typ       | 81 typ       | 81 typ       | 81 typ |
|                       |                           |         | 220V                                                                                                    |                             |              |              |              |        |
| INRUSH CURRENT        |                           |         | 20A typ (ACIN 110V, I <sub>o</sub> =100%), 40A typ(ACIN 220V, I <sub>o</sub> =100%) at cold start.      |                             |              |              |              |        |
| OUTPUT                | VOLTAGE                   | [V]     | 3.3                                                                                                     | 5                           | 9            | 12           | 15           |        |
|                       | CURRENT                   | [A]     | 20                                                                                                      | 20                          | 11.1         | 8.3          | 6.7          |        |
|                       | REGULATION, LINE          | [mV]    | 25 Max                                                                                                  | 25 Max                      | 45 Max       | 60 Max       | 75 Max       |        |
|                       | REGULATION, LOAD          | [mV]    | 50 Max                                                                                                  | 50 Max                      | 90 Max       | 120 Max      | 150 Max      |        |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                                  | 50 Max                      | 90 Max       | 120 Max      | 150 Max      |        |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                                 | 100 Max                     | 140 Max      | 170 Max      | 200 Max      |        |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 50 Max                                                                                                  | 75 Max                      | 135 Max      | 180 Max      | 225 Max      |        |
|                       | RISE TIME                 | [ms]    | 500 max (AC IN 110V, I <sub>o</sub> =100%)                                                              |                             |              |              |              |        |
|                       | HOLDING TIME              | [ms]    | 16 typ (AC IN 110V, I <sub>o</sub> =100%)                                                               |                             |              |              |              |        |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                                 |                             |              |              |              |        |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~140% of rating                                                                            |                             |              |              |              |        |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |              |              |              |        |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |              |              |              |        |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                          |                             |              |              |              |        |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                                |                             |              |              |              |        |
|                       | STORAGE TEMPAND HUMID     |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                                |                             |              |              |              |        |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                     |                             |              |              |              |        |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                               |                             |              |              |              |        |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                            | UL, C-UL, CE                | UL, C-UL, CE | UL, C-UL, CE | UL, C-UL, CE |        |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                     |                             |              |              |              |        |

## MSF100-S SPECIFICATIONS



|                       | MODEL                          | MSF100-24                                                                                               | MSF100-28                  | MSF100-36    | MSF100-48    |
|-----------------------|--------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------|--------------|--------------|
| INPUT                 | VOLTAGE, FREQUENCY             | AC100-120V / 200-240V (AC85 ~ 132V / 170 ~ 264V or DC240 ~ 370V), 50/60Hz (47 ~ 440Hz) User Selectable. |                            |              |              |
|                       | CURRENT [A]                    | 110V                                                                                                    | 2.5 (I <sub>o</sub> =100%) |              |              |
|                       |                                | 220V                                                                                                    | 2.5 (I <sub>o</sub> =100%) |              |              |
|                       | EFFICIENCY [%]                 | 110V                                                                                                    | 82 typ                     | 82 typ       | 82 typ       |
|                       |                                | 220V                                                                                                    | 82 typ                     | 82 typ       | 82 typ       |
| OUTPUT                | INRUSH CURRENT                 | 20A typ(ACIN 110V, I <sub>o</sub> =100%), 40A typ(ACIN 220V, I <sub>o</sub> =100%) at cold start.       |                            |              |              |
|                       | VOLTAGE [V]                    | 24                                                                                                      | 28                         | 36           | 48           |
|                       | CURRENT [A]                    | 4.2                                                                                                     | 3.5                        | 2.8          | 2.1          |
|                       | REGULATION, LINE [mV]          | 120 Max                                                                                                 | 140 Max                    | 180 Max      | 240 Max      |
|                       | REGULATION, LOAD [mV]          | 240 Max                                                                                                 | 280 Max                    | 360 Max      | 480 Max      |
|                       | RIPPLE [mVp-p]                 | 240 Max                                                                                                 | 280 Max                    | 360 Max      | 480 Max      |
|                       | RIPPLE, NOISE [mVp-p]          | 290 Max                                                                                                 | 330 Max                    | 410 Max      | 530 Max      |
|                       | TEMPERATURE DRIFT 0~+50°C [mV] | 360 Max                                                                                                 | 420 Max                    | 540 Max      | 720 Max      |
|                       | RISE TIME [ms]                 | 500 max (AC IN 110V, I <sub>o</sub> =100%)                                                              |                            |              |              |
|                       | HOLDING TIME [ms]              | 16 typ (AC IN 110V, I <sub>o</sub> =100%)                                                               |                            |              |              |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION        | Works at over 110% of rating and recovers automatically                                                 |                            |              |              |
|                       | OVER VOLTAGE PROTECTION        | Works at 115 ~ 140% of rating                                                                           |                            |              |              |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT                   | AC 3,000V 1 minute current 20mA, DC 500V 100MQ (At room temperature & Humidity)                         |                            |              |              |
|                       | INPUT-CASE, FG                 | AC 2,000V 1 minute current 20mA, DC 500V 100MQ (At room temperature & Humidity)                         |                            |              |              |
|                       | OUTPUT-CASE, FG                | AC 500V 1 minute current 100mA, DC 500V 100MQ (At room temperature & Humidity)                          |                            |              |              |
| ENVIRONMENT           | OPERATING TEMP AND HUMID       | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                                |                            |              |              |
|                       | STORAGE TEMP AND HUMID         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                                |                            |              |              |
|                       | VIBRATION                      | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                     |                            |              |              |
|                       | IMPACT                         | 10G for 20ms once on each X, Y and Z axis                                                               |                            |              |              |
| SAFETY                | SAFETY REGULATION              | UL, C-UL, CE                                                                                            | UL, C-UL, CE               | UL, C-UL, CE | UL, C-UL, CE |
|                       | LINE CONDUCTED RF VOLTAGE      | Complied with FCC Part15 and EN55022 Class A Limits                                                     |                            |              |              |

## MSF100-S EXTERNAL VIEW



- \* Weight : 650g
- \* Tolerance : ±1
- \* Dimensions in mm

## MSF150-S SPECIFICATIONS



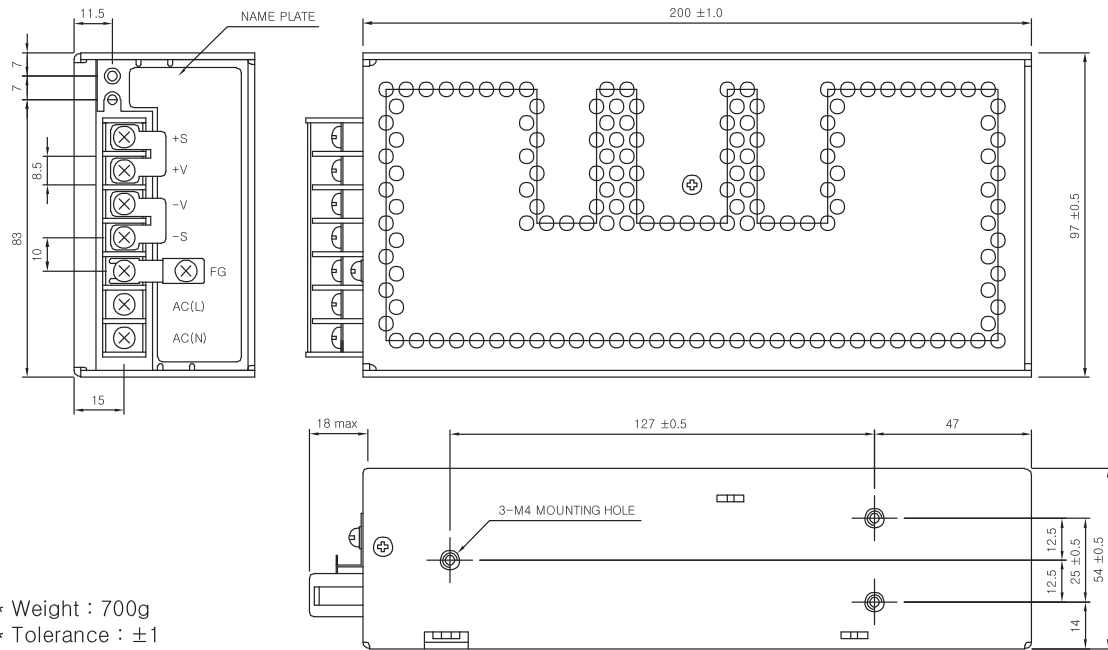
|                       | MODEL                     |         | MSF150-3R3                                                                                             | MSF150-05                   | MSF150-12    | MSF150-15    |        |
|-----------------------|---------------------------|---------|--------------------------------------------------------------------------------------------------------|-----------------------------|--------------|--------------|--------|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-120V / 200-240V (AC90 ~ 132V / 180 ~ 264V or DC240 ~ 370V), 50/60Hz (47 ~ 440Hz) User Selectable |                             |              |              |        |
|                       | CURRENT                   | [A]     | 110V                                                                                                   | 3.2 ( I <sub>o</sub> =100%) |              |              |        |
|                       |                           |         | 220V                                                                                                   | 1.7 ( I <sub>o</sub> =100%) |              |              |        |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                   | 75 typ                      | 75 typ       | 75 typ       | 75 typ |
|                       |                           |         | 220V                                                                                                   |                             |              |              |        |
| INRUSH CURRENT        |                           |         | 15A typ(AC IN 110V, I <sub>o</sub> =100%), 30A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start.    |                             |              |              |        |
| OUTPUT                | VOLTAGE                   | [V]     | 3.3                                                                                                    | 5                           | 12           | 15           |        |
|                       | CURRENT                   | [A]     | 30                                                                                                     | 29                          | 12           | 10           |        |
|                       | REGULATION, LINE          | [mV]    | 25 Max                                                                                                 | 25 Max                      | 60 Max       | 75 Max       |        |
|                       | REGULATION, LOAD          | [mV]    | 50 Max                                                                                                 | 50 Max                      | 120 Max      | 150 Max      |        |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                                 | 50 Max                      | 120 Max      | 150 Max      |        |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                                | 100 Max                     | 170 Max      | 200 Max      |        |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 50 Max                                                                                                 | 75 Max                      | 180 Max      | 225 Max      |        |
|                       | RISE TIME                 | [ms]    | 800 max (AC IN 110V, I <sub>o</sub> =100%)                                                             |                             |              |              |        |
|                       | HOLDING TIME              | [ms]    | 15 typ (AC IN 110V, I <sub>o</sub> =100%)                                                              |                             |              |              |        |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                                |                             |              |              |        |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating                                                                          |                             |              |              |        |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                        |                             |              |              |        |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                        |                             |              |              |        |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |              |              |        |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                               |                             |              |              |        |
|                       | STORAGE TEMP AND HUMID    |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                               |                             |              |              |        |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                    |                             |              |              |        |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                              |                             |              |              |        |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                           | UL, C-UL, CE                | UL, C-UL, CE | UL, C-UL, CE |        |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                    |                             |              |              |        |

## MSF150-S SPECIFICATIONS



|                       | MODEL                     |         | MSF150-24                                                                                              | MSF150-28                   | MSF150-36    | MSF150-48    |        |
|-----------------------|---------------------------|---------|--------------------------------------------------------------------------------------------------------|-----------------------------|--------------|--------------|--------|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-120V / 200-240V (AC90 ~ 132V / 180 ~ 264V or DC240 ~ 370V), 50/60Hz (47 ~ 440Hz) User Selectable |                             |              |              |        |
|                       | CURRENT                   | [A]     | 110V                                                                                                   | 3.2 ( I <sub>o</sub> =100%) |              |              |        |
|                       |                           |         | 220V                                                                                                   | 1.7 ( I <sub>o</sub> =100%) |              |              |        |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                   | 75 typ                      | 75 typ       | 75 typ       | 75 typ |
|                       |                           |         | 220V                                                                                                   |                             |              |              |        |
| INRUSH CURRENT        |                           |         | 15A typ(AC IN 110V, I <sub>o</sub> =100%), 30A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start).   |                             |              |              |        |
| OUTPUT                | VOLTAGE                   | [V]     | 24                                                                                                     | 28                          | 36           | 48           |        |
|                       | CURRENT                   | [A]     | 6                                                                                                      | 5.5                         | 4.1          | 3.2          |        |
|                       | REGULATION, LINE          | [mV]    | 120 Max                                                                                                | 140 Max                     | 180 Max      | 240 Max      |        |
|                       | REGULATION, LOAD          | [mV]    | 240 Max                                                                                                | 280 Max                     | 360 Max      | 480 Max      |        |
|                       | RIPPLE                    | [mVp-p] | 240 Max                                                                                                | 280 Max                     | 360 Max      | 480 Max      |        |
|                       | RIPPLE, NOISE             | [mVp-p] | 290 Max                                                                                                | 330 Max                     | 410 Max      | 530 Max      |        |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 360 Max                                                                                                | 420 Max                     | 540 Max      | 720 Max      |        |
|                       | RISE TIME                 | [ms]    | 800 max (AC IN 110V, I <sub>o</sub> =100%)                                                             |                             |              |              |        |
|                       | HOLDING TIME              | [ms]    | 15 typ (AC IN 110V, I <sub>o</sub> =100%)                                                              |                             |              |              |        |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                                |                             |              |              |        |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating                                                                          |                             |              |              |        |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                        |                             |              |              |        |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                        |                             |              |              |        |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |              |              |        |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                               |                             |              |              |        |
|                       | STORAGE TEMP AND HUMID    |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                               |                             |              |              |        |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                    |                             |              |              |        |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                              |                             |              |              |        |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                           | UL, C-UL, CE                | UL, C-UL, CE | UL, C-UL, CE |        |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                    |                             |              |              |        |

## MSF150-S EXTERNAL VIEW



- \* Weight : 700g
- \* Tolerance :  $\pm 1$
- \* Dimensions in mm

## MSF200-S SPECIFICATIONS



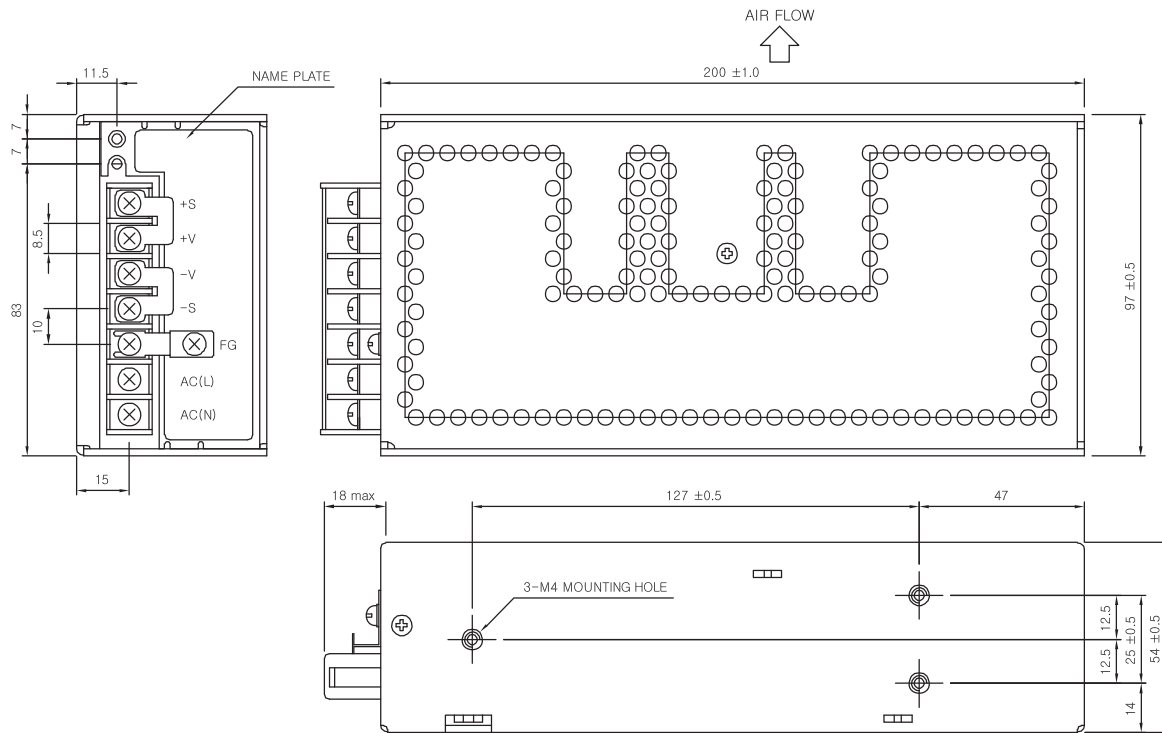
|                       | MODEL                     |         | MSF200-3R3                                                                                               | MSF200-5                    | MSF200-12                   | MSF200-15    |        |
|-----------------------|---------------------------|---------|----------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|--------------|--------|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-120V / 200-240V (AC 90 ~ 132V / 180 ~ 264V or AC 255 ~ 370V), 50/60Hz (47 ~ 440Hz) User Selectable |                             |                             |              |        |
|                       | CURRENT                   | [A]     | 110V                                                                                                     | 3.4 ( I <sub>o</sub> =100%) | 4.1 ( I <sub>o</sub> =100%) |              |        |
|                       |                           |         | 220V                                                                                                     | 4.1 ( I <sub>o</sub> =100%) | 2.0 ( I <sub>o</sub> =100%) |              |        |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                     | 75 typ                      | 75 typ                      | 80 typ       | 80 typ |
|                       |                           |         | 220V                                                                                                     |                             |                             |              |        |
| INRUSH CURRENT        |                           |         | 15A typ(AC IN 110V, I <sub>o</sub> =100%), 30A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start.      |                             |                             |              |        |
| OUTPUT                | VOLTAGE                   | [V]     | 3.3                                                                                                      | 5                           | 12                          | 15           |        |
|                       | CURRENT                   | [A]     | 40                                                                                                       | 40                          | 17                          | 13           |        |
|                       | REGULATION, LINE          | [mV]    | 25 Max                                                                                                   | 25 Max                      | 60 Max                      | 75 Max       |        |
|                       | REGULATION, LOAD          | [mV]    | 50 Max                                                                                                   | 50 Max                      | 120 Max                     | 150 Max      |        |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                                   | 50 Max                      | 120 Max                     | 150 Max      |        |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                                  | 100 Max                     | 170 Max                     | 200 Max      |        |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 50 Max                                                                                                   | 75 Max                      | 180 Max                     | 225 Max      |        |
|                       | RISE TIME                 | [ms]    | 800 max (AC IN 110V, I <sub>o</sub> =100%)                                                               |                             |                             |              |        |
|                       | HOLDING TIME              | [ms]    | 15 typ (AC IN 110V, I <sub>o</sub> =100%)                                                                |                             |                             |              |        |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                                  |                             |                             |              |        |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating (In the case of 3.3V, it is 115 ~ 160%)                                    |                             |                             |              |        |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                          |                             |                             |              |        |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                          |                             |                             |              |        |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                           |                             |                             |              |        |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                                 |                             |                             |              |        |
|                       | STORAGE TEMP AND HUMID    |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                                 |                             |                             |              |        |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                      |                             |                             |              |        |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                                |                             |                             |              |        |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                             | UL, C-UL, CE                | UL, C-UL, CE                | UL, C-UL, CE |        |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                      |                             |                             |              |        |

## MSF200-S SPECIFICATIONS



|                       | MODEL                     |         | MSF200-24                                                                                               | MSF200-28                   | MSF200-36    | MSF200-48    |        |
|-----------------------|---------------------------|---------|---------------------------------------------------------------------------------------------------------|-----------------------------|--------------|--------------|--------|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-120V / 200-240V (AC 90~ 132V / 180 ~ 264V or AC 225 ~ 370V), 50/60Hz (47 ~ 440Hz) User Selectable |                             |              |              |        |
|                       | CURRENT                   | [A]     | 110V                                                                                                    | 4.1 ( I <sub>o</sub> =100%) |              |              |        |
|                       |                           |         | 220V                                                                                                    | 2.0 ( I <sub>o</sub> =100%) |              |              |        |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                    | 80 typ                      | 80 typ       | 82 typ       | 82 typ |
|                       |                           |         | 220V                                                                                                    |                             |              |              |        |
| INRUSH CURRENT        |                           |         | 15A typ(ACIN 110V, I <sub>o</sub> =100%), 30A typ(ACIN 220V, I <sub>o</sub> =100%) at cold start.       |                             |              |              |        |
| OUTPUT                | VOLTAGE                   | [V]     | 24                                                                                                      | 28                          | 36           | 48           |        |
|                       | CURRENT                   | [A]     | 8.3                                                                                                     | 7.1                         | 5.5          | 4.1          |        |
|                       | REGULATION, LINE          | [mV]    | 120 Max                                                                                                 | 140 Max                     | 180 Max      | 240 Max      |        |
|                       | REGULATION, LOAD          | [mV]    | 240 Max                                                                                                 | 280 Max                     | 360 Max      | 480 Max      |        |
|                       | RIPPLE                    | [mVp-p] | 240 Max                                                                                                 | 280 Max                     | 360 Max      | 480 Max      |        |
|                       | RIPPLE, NOISE             | [mVp-p] | 290 Max                                                                                                 | 330 Max                     | 410 Max      | 530 Max      |        |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 360 Max                                                                                                 | 420 Max                     | 540 Max      | 720 Max      |        |
|                       | RISE TIME                 | [ms]    | 800 max (AC IN 110V, I <sub>o</sub> =100%)                                                              |                             |              |              |        |
| HOLDING TIME          |                           | [ms]    | 15 typ (AC IN 110V, I <sub>o</sub> =100%)                                                               |                             |              |              |        |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                                 |                             |              |              |        |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating                                                                           |                             |              |              |        |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |              |              |        |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |              |              |        |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                          |                             |              |              |        |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                                |                             |              |              |        |
|                       | STORAGE TEMP AND HUMID    |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                                |                             |              |              |        |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                     |                             |              |              |        |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                               |                             |              |              |        |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                            | UL, C-UL, CE                | UL, C-UL, CE | UL, C-UL, CE |        |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                     |                             |              |              |        |

## MSF200-S EXTERNAL VIEW



General Information

Switching Mode Power Supply

DC-DC Converter

Noise Filter

Solid State Relay

AC FAN Motor

Power Module

Discrete Semiconductors

## MSF300-S SPECIFICATIONS



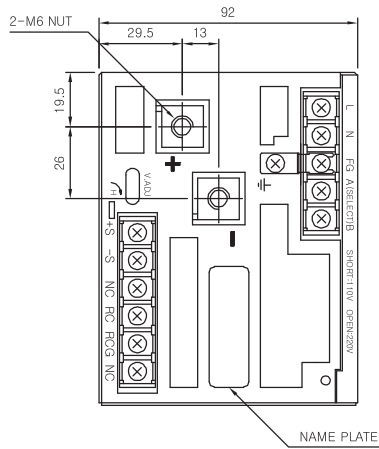
|                       | MODEL                     |         | MSF300-3R3                                                                                             | MSF300-05                   | MSF300-12                   | MSF300-15    |        |
|-----------------------|---------------------------|---------|--------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|--------------|--------|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-120V / 200-240V (AC90 ~ 132V / 180 ~ 264V or DC255 ~ 370V), 50/60Hz (47 ~ 440Hz) User Selectable |                             |                             |              |        |
|                       | CURRENT                   | [A]     | 110V                                                                                                   | 6.5 ( I <sub>o</sub> =100%) | 7.0 ( I <sub>o</sub> =100%) |              |        |
|                       |                           |         | 220V                                                                                                   | 3.5 ( I <sub>o</sub> =100%) | 3.5 ( I <sub>o</sub> =100%) |              |        |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                   | 73 typ                      | 73 typ                      | 78 typ       | 80 typ |
|                       |                           |         | 220V                                                                                                   |                             |                             |              |        |
|                       | INRUSH CURRENT            |         | 30A typ(AC IN 110V, I <sub>o</sub> =100%), 60A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start.    |                             |                             |              |        |
| OUTPUT                | VOLTAGE                   | [V]     | 3.3                                                                                                    | 5                           | 12                          | 15           |        |
|                       | CURRENT                   | [A]     | 60                                                                                                     | 60                          | 25                          | 20           |        |
|                       | REGULATION, LINE          | [mV]    | 25 Max                                                                                                 | 25 Max                      | 60 Max                      | 75 Max       |        |
|                       | REGULATION, LOAD          | [mV]    | 50 Max                                                                                                 | 50 Max                      | 120 Max                     | 150 Max      |        |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                                 | 50 Max                      | 120 Max                     | 150 Max      |        |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                                | 100 Max                     | 170 Max                     | 200 Max      |        |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 50 Max                                                                                                 | 75 Max                      | 180 Max                     | 225 Max      |        |
|                       | RISE TIME                 | [ms]    | 500 max (AC IN 110V, I <sub>o</sub> =100%)                                                             |                             |                             |              |        |
|                       | HOLDING TIME              | [ms]    | 16 typ (AC IN 110V, I <sub>o</sub> =100%)                                                              |                             |                             |              |        |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                                |                             |                             |              |        |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating                                                                          |                             |                             |              |        |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                        |                             |                             |              |        |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                        |                             |                             |              |        |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |                             |              |        |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                               |                             |                             |              |        |
|                       | STORAGE TEMP AND HUMID    |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                               |                             |                             |              |        |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                    |                             |                             |              |        |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                              |                             |                             |              |        |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                           | UL, C-UL, CE                | UL, C-UL, CE                | UL, C-UL, CE |        |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                    |                             |                             |              |        |

## MSF300-S SPECIFICATIONS

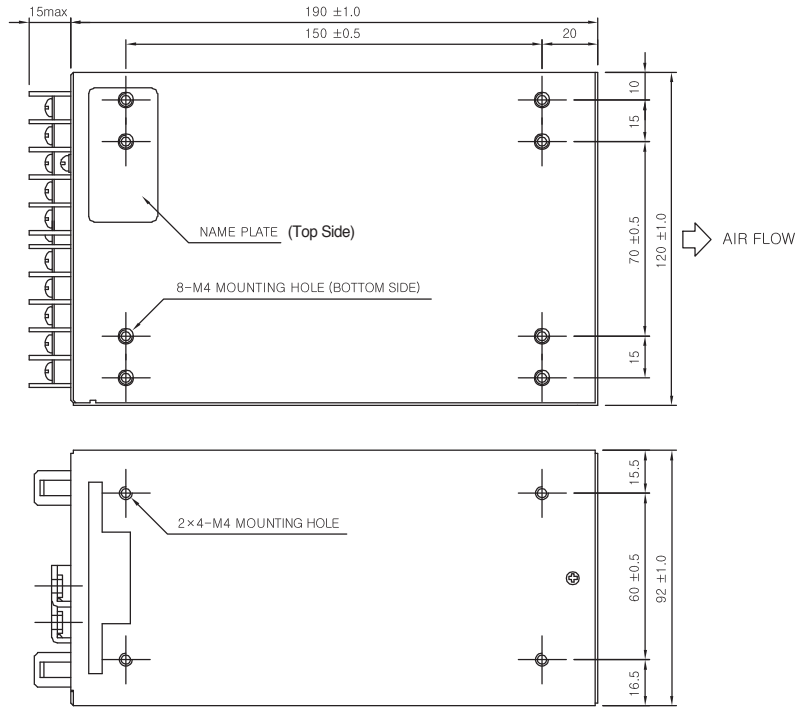


|                       | MODEL                     |         | MSF300-24                                                                                              | MSF300-28                   | MSF300-36    | MSF300-48    |        |
|-----------------------|---------------------------|---------|--------------------------------------------------------------------------------------------------------|-----------------------------|--------------|--------------|--------|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-120V / 200~240V (AC90 ~ 132V / 180 ~ 264V or DC255 ~ 370V), 50/60Hz (47 ~ 440Hz) User Selectable |                             |              |              |        |
|                       | CURRENT                   | [A]     | 110V                                                                                                   | 7.0 ( I <sub>o</sub> =100%) |              |              |        |
|                       |                           |         | 220V                                                                                                   | 3.5 ( I <sub>o</sub> =100%) |              |              |        |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                   | 81 typ                      | 82 typ       | 82 typ       | 83 typ |
|                       |                           |         | 220V                                                                                                   |                             |              |              |        |
| INRUSH CURRENT        |                           |         | 30A typ(AC IN 110V, I <sub>o</sub> =100%), 60A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start.    |                             |              |              |        |
| OUTPUT                | VOLTAGE                   | [V]     | 24                                                                                                     | 28                          | 36           | 48           |        |
|                       | CURRENT                   | [A]     | 13                                                                                                     | 11                          | 8.5          | 6.5          |        |
|                       | REGULATION, LINE          | [mV]    | 120 Max                                                                                                | 140 Max                     | 180 Max      | 240 Max      |        |
|                       | REGULATION, LOAD          | [mV]    | 240 Max                                                                                                | 280 Max                     | 360 Max      | 480 Max      |        |
|                       | RIPPLE                    | [mVp-p] | 240 Max                                                                                                | 280 Max                     | 360 Max      | 480 Max      |        |
|                       | RIPPLE, NOISE             | [mVp-p] | 290 Max                                                                                                | 330 Max                     | 410 Max      | 530 Max      |        |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 360 Max                                                                                                | 420 Max                     | 540 Max      | 720 Max      |        |
|                       | RISE TIME                 | [ms]    | 500 max (AC IN 110V, I <sub>o</sub> =100%)                                                             |                             |              |              |        |
|                       | HOLDING TIME              | [ms]    | 20 typ (AC IN 110V, I <sub>o</sub> =100%)                                                              |                             |              |              |        |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                                |                             |              |              |        |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating                                                                          |                             |              |              |        |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                        |                             |              |              |        |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                        |                             |              |              |        |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |              |              |        |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                               |                             |              |              |        |
|                       | STORAGE TEMP AND HUMID    |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                               |                             |              |              |        |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                    |                             |              |              |        |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                              |                             |              |              |        |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                           | UL, C-UL, CE                | UL, C-UL, CE | UL, C-UL, CE |        |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                    |                             |              |              |        |

## MSF300-S EXTERNAL VIEW



- \* Weight : 2Kg
- \* Tolerance :  $\pm 1$
- \* Dimensions in mm



## ORDERING INFORMATION



# MSF30-BDW

Series name

Total output wattage

Output voltage combination

- Approve by UL/C-UL, CE
- Inrush current limit
- Over current protection
- Over voltage protection
- Complies with FCC Part15 and EN55022 Class A Limits
- 3 years warranty

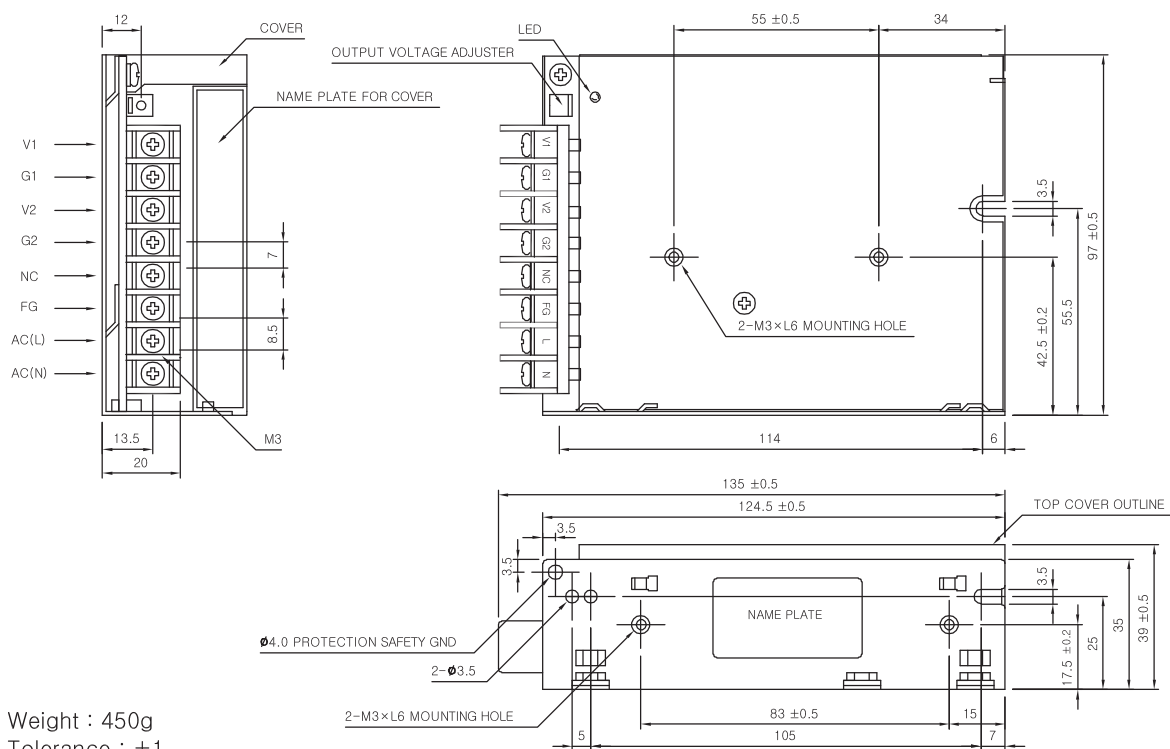


## MSF30-DUAL SPECIFICATIONS



|                       | MODEL                     |         | MSF30-BDW                                                                                           |                             | MSF30-BHW    |           |  |
|-----------------------|---------------------------|---------|-----------------------------------------------------------------------------------------------------|-----------------------------|--------------|-----------|--|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-240V (AC85 ~ 264V or DC125 ~ 370V), 50/60Hz (47 ~ 440Hz) Universal Input                      |                             |              |           |  |
|                       | CURRENT                   | [A]     | 110V                                                                                                | 1.0 ( I <sub>o</sub> =100%) |              |           |  |
|                       |                           |         | 220V                                                                                                | 6.0 ( I <sub>o</sub> =100%) |              |           |  |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                | 70 typ                      |              | 70 typ    |  |
|                       |                           |         | 220V                                                                                                |                             |              |           |  |
| INRUSH CURRENT        |                           |         | 20A typ (AC IN 110V, I <sub>o</sub> =100%), 40A typ(AC IN 220, I <sub>o</sub> =100%) at cold start. |                             |              |           |  |
| OUTPUT                | VOLTAGE                   | [V]     | 5                                                                                                   | 12                          | 5            | 24        |  |
|                       | CURRENT                   | [A]     | 0.6 ~ 3                                                                                             | 0.36 ~ 1.2                  | 0.6 ~ 3      | 0.2 ~ 0.7 |  |
|                       | REGULATIONS, LINE         | [mV]    | 50 Max                                                                                              | 120 Max                     | 50 Max       | 240 Max   |  |
|                       | REGULATIONS, LOAD         | [mV]    | 100 Max                                                                                             | 1200 Max                    | 100 Max      | 2400 Max  |  |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                              | 120 Max                     | 50 Max       | 240 Max   |  |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                             | 170 Max                     | 100 Max      | 290 Max   |  |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 75 Max                                                                                              | 180 Max                     | 75 Max       | 360 Max   |  |
|                       | RISE TIME                 | [ms]    | 1000 max (AC IN 85V, I <sub>o</sub> =100%)                                                          |                             |              |           |  |
|                       | HOLDING TIME              | [ms]    | 16 min (AC IN 85V, I <sub>o</sub> =100%)                                                            |                             |              |           |  |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                             |                             |              |           |  |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating                                                                       |                             |              |           |  |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                     |                             |              |           |  |
|                       | INPUT-CASE, FG            |         | AC2 ,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                     |                             |              |           |  |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                      |                             |              |           |  |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                            |                             |              |           |  |
|                       | STORAGE TEMPAND HUMID     |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                            |                             |              |           |  |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                 |                             |              |           |  |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                           |                             |              |           |  |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                        |                             | UL, C-UL, CE |           |  |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                 |                             |              |           |  |

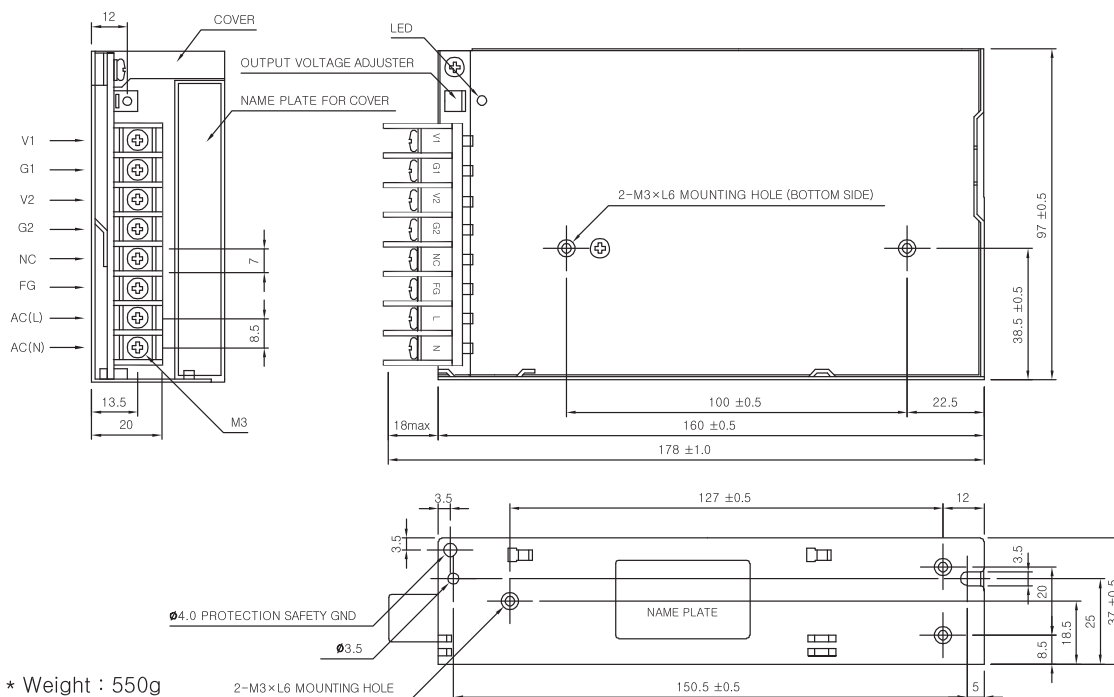
## MSF30-DUAL EXTERNAL VIEW



- \* Weight : 450g
- \* Tolerance :  $\pm 1$
- \* Dimensions in mm

**MSF50-DUAL SPECIFICATIONS**

|                       | MODEL                          | MSF50-BDW                                                                                           | MSF50-BHW                   |
|-----------------------|--------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------|
| INPUT                 | VOLTAGE, FREQUENCY             | AC100-240V (AC85 ~ 264V or DC110 ~ 370V), 50/60Hz (43 ~ 440Hz) Universal Input                      |                             |
|                       | CURRENT [A]                    | 110V                                                                                                | 1.5 (I <sub>o</sub> =100%)  |
|                       |                                | 220V                                                                                                | 0.75 (I <sub>o</sub> =100%) |
|                       | EFFICIENCY [%]                 | 110V                                                                                                | 72 typ                      |
|                       |                                | 220V                                                                                                | 72 typ                      |
| OUTPUT                | INRUSH CURRENT                 | 20A typ(AC IN 110V, I <sub>o</sub> =100%), 40A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start. |                             |
|                       | VOLTAGE [V]                    | 5                                                                                                   | 12                          |
|                       | CURRENT [A]                    | 1.2 ~ 6                                                                                             | 0.6 ~ 2                     |
|                       | REGULATIONS, LINE [mV]         | 100 Max                                                                                             | 1200 Max                    |
|                       | REGULATIONS, LOAD [mV]         | 100 Max                                                                                             | 1200 Max                    |
|                       | RIPPLE [mVp-p]                 | 50 Max                                                                                              | 120 Max                     |
|                       | RIPPLE, NOISE [mVp-p]          | 100 Max                                                                                             | 170 Max                     |
|                       | TEMPERATURE DRIFT 0~+50°C [mV] | 75 Max                                                                                              | 180 Max                     |
|                       | RISE TIME [ms]                 | 1000 max (AC IN 100V, I <sub>o</sub> =100%)                                                         |                             |
| PROTECTION CIRCUIT    | HOLDING TIME [ms]              | 16 typ (AC IN 100V, I <sub>o</sub> =100%)                                                           |                             |
|                       | OVER CURRENT PROTECTION        | Works at over 110% of rating and recovers automatically                                             |                             |
| ELECTRICALLY ISOLATED | OVER VOLTAGE PROTECTION        | Works at 115 ~ 140% of rating                                                                       |                             |
|                       | INPUT-OUTPUT                   | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                     |                             |
|                       | INPUT-CASE, FG                 | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                     |                             |
| ENVIRONMENT           | OUTPUT-CASE, FG                | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                      |                             |
|                       | OPERATING TEMP AND HUMID       | -10~ +50°C, 20 ~ 90% RH(Non condensing)                                                             |                             |
|                       | STORAGE TEMP AND HUMID         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                            |                             |
|                       | VIBRATION                      | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                 |                             |
| SAFETY                | IMPACT                         | 10G for 20ms once on each X, Y and Z axis                                                           |                             |
|                       | SAFETY REGULATION              | UL, C-UL, CE                                                                                        | UL, C-UL, CE                |
| SAFETY                | LINE CONDUCTED RF VOLTAGE      | Complied with FCC Part15 and EN55022 Class A Limits                                                 |                             |

**MSF50-DUAL EXTERNAL VIEW**

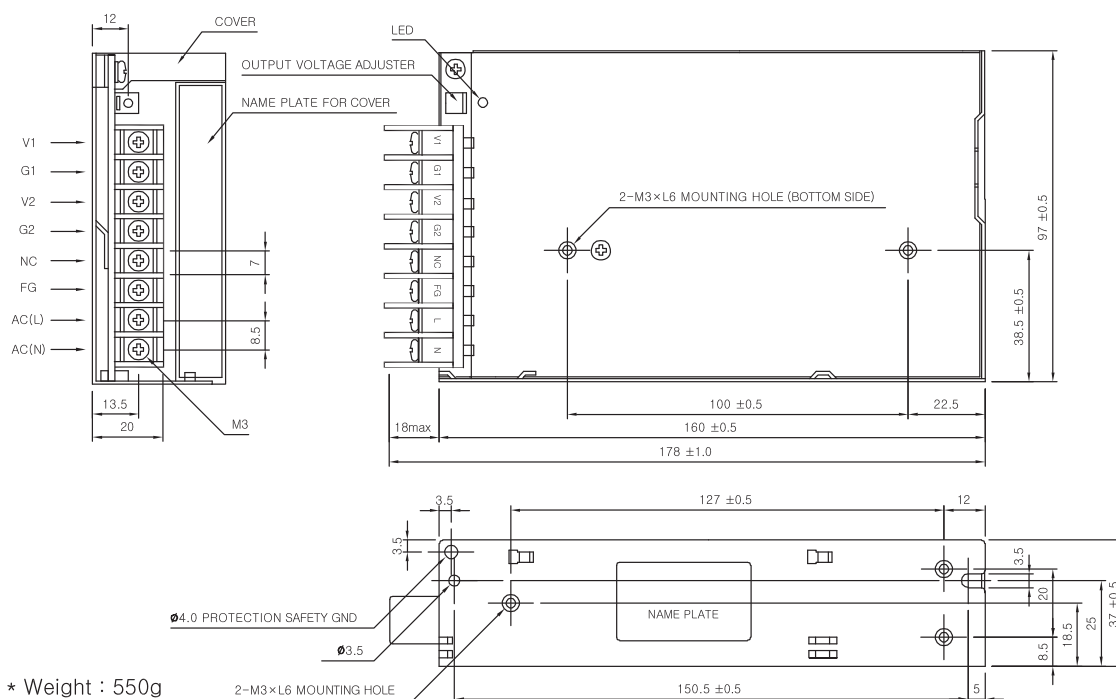
- \* Weight : 550g
- \* Tolerance : ±1
- \* Dimensions in mm

## MSF60-DUAL SPECIFICATIONS



|                       | MODEL                     |         | MSF60-BDW                                                                                           |                             | MSF60-BHW    |            | MSF60-ADW |          |  |
|-----------------------|---------------------------|---------|-----------------------------------------------------------------------------------------------------|-----------------------------|--------------|------------|-----------|----------|--|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-240V (AC85 ~ 264V or DC110 ~ 370V), 50/60Hz (47 ~ 440Hz) Universal Input                      |                             |              |            |           |          |  |
|                       | CURRENT                   | [A]     | 110V                                                                                                | 1.8 ( I <sub>o</sub> =100%) |              |            |           |          |  |
|                       |                           |         | 220V                                                                                                | 0.9 ( I <sub>o</sub> =100%) |              |            |           |          |  |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                | 75 typ                      |              | 75 typ     |           | 75 typ   |  |
|                       |                           |         | 220V                                                                                                |                             |              |            |           |          |  |
|                       | INRUSH CURRENT            |         | 20A typ(AC IN 110V, I <sub>o</sub> =100%), 40A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start. |                             |              |            |           |          |  |
| OUTPUT                | VOLTAGE                   | [V]     | 5                                                                                                   | 12                          | 5            | 24         | 3.3       | 12       |  |
|                       | CURRENT                   | [A]     | 0.8 ~ 4                                                                                             | 0.9 ~ 3                     | 0.6 ~ 3      | 0.54 ~ 1.8 | 0.8 ~ 4   | 0.9 ~ 3  |  |
|                       | REGULATIONS, LINE         | [mV]    | 100 Max                                                                                             | 1200 Max                    | 100 Max      | 2400 Max   | 100 Max   | 1200 Max |  |
|                       | REGULATIONS, LOAD         | [mV]    | 100 Max                                                                                             | 1200 Max                    | 100 Max      | 2400 Max   | 100 Max   | 1200 Max |  |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                              | 120 Max                     | 50 Max       | 240 Max    | 50 Max    | 120 Max  |  |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                             | 170 Max                     | 100 Max      | 290 Max    | 100 Max   | 170 Max  |  |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 75 Max                                                                                              | 180 Max                     | 75 Max       | 360 Max    | 50 Max    | 180 Max  |  |
|                       | RISE TIME                 | [ms]    | 1000 max (AC IN 110V, I <sub>o</sub> =100%)                                                         |                             |              |            |           |          |  |
|                       | HOLDING TIME              | [ms]    | 16 typ (AC IN 110V, I <sub>o</sub> =100%)                                                           |                             |              |            |           |          |  |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                             |                             |              |            |           |          |  |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating                                                                       |                             |              |            |           |          |  |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                     |                             |              |            |           |          |  |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                     |                             |              |            |           |          |  |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                      |                             |              |            |           |          |  |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                            |                             |              |            |           |          |  |
|                       | STORAGE TEMP AND HUMID    |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                            |                             |              |            |           |          |  |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                 |                             |              |            |           |          |  |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                           |                             |              |            |           |          |  |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                        |                             | UL, C-UL, CE |            | -         |          |  |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                 |                             |              |            |           |          |  |

## MSF60-DUAL EXTERNAL VIEW



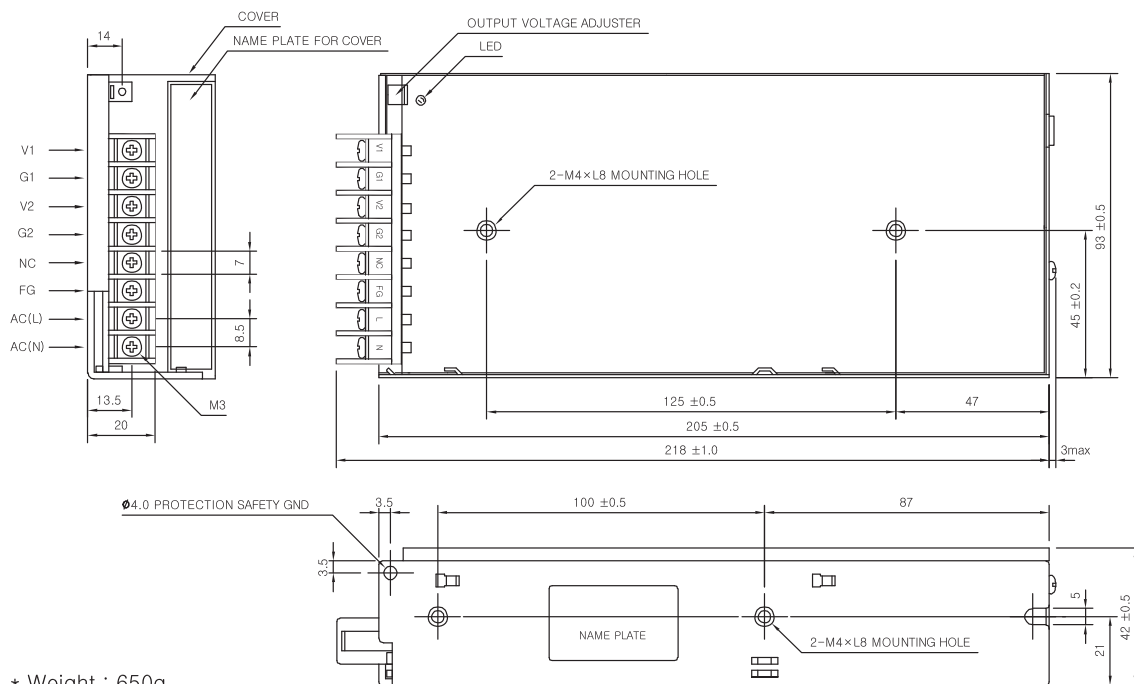
- \* Weight : 550g
- \* Tolerance :  $\pm 1$
- \* Dimensions in mm

## MSF80-DUAL SPECIFICATIONS



|                       | MODEL                          | MSF80-BDW                                                                                               | MSF80-BHW                  |
|-----------------------|--------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------|
| INPUT                 | VOLTAGE, FREQUENCY             | AC100-120V / 200-240V (AC90 ~ 132V / 180 ~ 264V or DC240 ~ 370V), 50/60Hz (47 ~ 440Hz) User Selectable. |                            |
|                       | CURRENT [A]                    | 110V                                                                                                    | 2.0 (I <sub>o</sub> =100%) |
|                       |                                | 220V                                                                                                    | 1.0 (I <sub>o</sub> =100%) |
|                       | EFFICIENCY [%]                 | 110V                                                                                                    | 75 typ                     |
| OUTPUT                |                                | 220V                                                                                                    | 75 typ                     |
|                       | INRUSH CURRENT                 | 20A typ (AC IN 110V, I <sub>o</sub> =100%), 40A typ (AC IN 220V, I <sub>o</sub> =100%) at cold start.   |                            |
|                       | VOLTAGE [V]                    | 5                                                                                                       | 12                         |
|                       | CURRENT [A]                    | 1.4 ~ 7                                                                                                 | 1 ~ 3.5                    |
| PROTECTION CIRCUIT    | REGULATIONS, LINE [mV]         | 100 Max                                                                                                 | 1200 Max                   |
|                       | REGULATIONS, LOAD [mV]         | 100 Max                                                                                                 | 1200 Max                   |
|                       | RIPPLE [mVp-p]                 | 50 Max                                                                                                  | 120 Max                    |
|                       | RIPPLE, NOISE [mVp-p]          | 100 Max                                                                                                 | 170 Max                    |
|                       | TEMPERATURE DRIFT 0~+50°C [mV] | 75 Max                                                                                                  | 180 Max                    |
|                       | RISE TIME [ms]                 | 1000 max (AC IN 100V, I <sub>o</sub> =100%)                                                             |                            |
|                       | HOLDING TIME [ms]              | 10 typ (AC IN 100V, I <sub>o</sub> =100%)                                                               |                            |
|                       | OVER CURRENT PROTECTION        | Works at over 110% of rating and recovers automatically                                                 |                            |
| ELECTRICALLY ISOLATED | OVER VOLTAGE PROTECTION        | Works at 120 ~ 150% of rating (CH1)                                                                     |                            |
|                       | INPUT-OUTPUT                   | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                            |
|                       | INPUT-CASE, FG                 | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                            |
|                       | OUTPUT-CASE, FG                | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                          |                            |
| ENVIRONMENT           | OPERATING TEMP AND HUMID       | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                                |                            |
|                       | STORAGE TEMP AND HUMID         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                                |                            |
|                       | VIBRATION                      | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                     |                            |
|                       | IMPACT                         | 10G for 20ms once on each X, Y and Z axis                                                               |                            |
| SAFETY                | SAFETY REGULATION              | UL, C-UL, CE                                                                                            | UL, C-UL, CE               |
|                       | LINE CONDUCTED RF VOLTAGE      | Complied with FCC Part15 and EN55022 Class A Limits                                                     |                            |

## MSF80-DUAL EXTERNAL VIEW



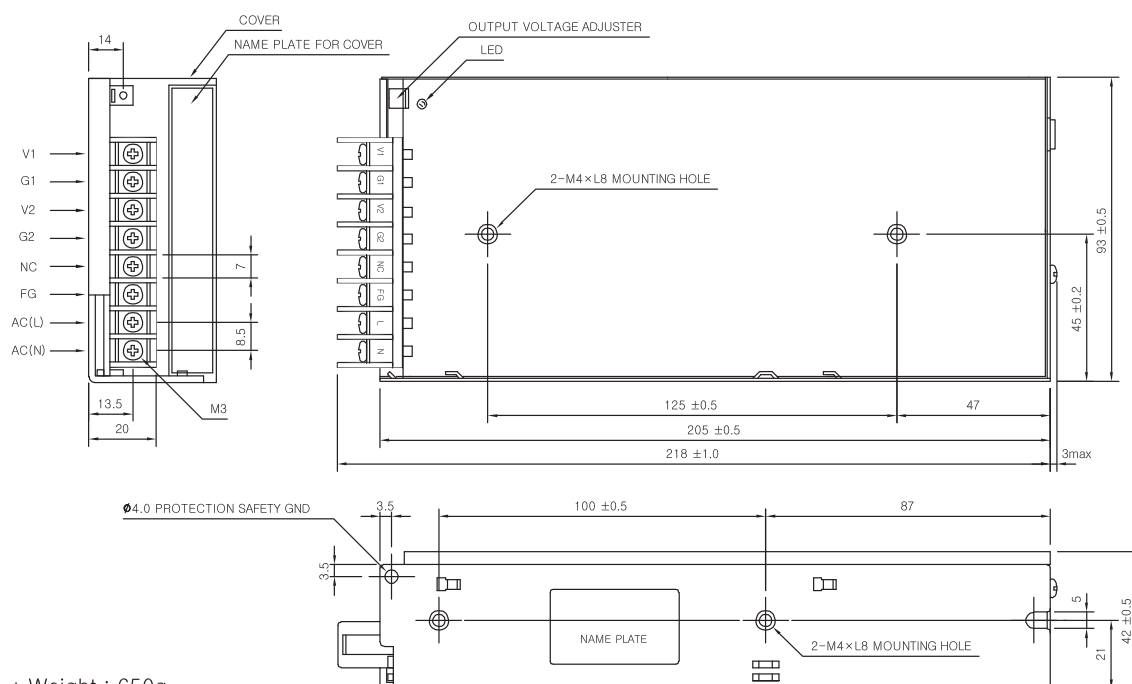
- \* Weight : 650g
- \* Tolerance : ±1
- \* Dimensions in mm

## MSF100-DUAL SPECIFICATIONS



|                       | MODEL                     |         | MSF100-BDW                                                                                              |                             | MSF100-BHW   |          |  |
|-----------------------|---------------------------|---------|---------------------------------------------------------------------------------------------------------|-----------------------------|--------------|----------|--|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-120V / 200-240V (AC90 ~ 132V / 180 ~ 264V or DC240 ~ 370V), 50/60Hz (47 ~ 440Hz) User Selectable. |                             |              |          |  |
|                       | CURRENT                   | [A]     | 110V                                                                                                    | 2.4 ( I <sub>o</sub> =100%) |              |          |  |
|                       |                           |         | 220V                                                                                                    | 1.4 ( I <sub>o</sub> =100%) |              |          |  |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                    | 75 typ                      |              | 75 typ   |  |
|                       |                           |         | 220V                                                                                                    |                             |              |          |  |
| INRUSH CURRENT        |                           |         | 20A typ (AC IN 110V, I <sub>o</sub> =100%), 40A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start.    |                             |              |          |  |
| OUTPUT                | VOLTAGE                   | [V]     | 5                                                                                                       | 12                          | 5            | 24       |  |
|                       | CURRENT                   | [A]     | 2 ~ 10                                                                                                  | 1.2 ~ 4                     | 2 ~ 10       | 0.6 ~ 2  |  |
|                       | REGULATIONS, LINE         | [mV]    | 100 Max                                                                                                 | 1200 Max                    | 100 Max      | 2400 Max |  |
|                       | REGULATIONS, LOAD         | [mV]    | 100 Max                                                                                                 | 1200 Max                    | 100 Max      | 2400 Max |  |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                                  | 120 Max                     | 50 Max       | 240 Max  |  |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                                 | 170 Max                     | 100 Max      | 290 Max  |  |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 75 Max                                                                                                  | 180 Max                     | 75 Max       | 360 Max  |  |
|                       | RISE TIME                 | [ms]    | 1000 max (AC IN 110V, I <sub>o</sub> =100%)                                                             |                             |              |          |  |
|                       | HOLDING TIME              | [ms]    | 10 typ (AC IN 110V, I <sub>o</sub> =100%)                                                               |                             |              |          |  |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                                 |                             |              |          |  |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 120 ~ 150% of rating (CH1)                                                                     |                             |              |          |  |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |              |          |  |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |              |          |  |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                          |                             |              |          |  |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                                |                             |              |          |  |
|                       | STORAGE TEMPAND HUMID     |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                                |                             |              |          |  |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                     |                             |              |          |  |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                               |                             |              |          |  |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                            |                             | UL, C-UL, CE |          |  |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                     |                             |              |          |  |

## MSF100-DUAL EXTERNAL VIEW



- \* Weight : 650g
- \* Tolerance :  $\pm 1$
- \* Dimensions in mm

## ORDERING INFORMATION

**NEW**

# MSF30-BDB

Series name

Total output wattage

Output voltage combination

- Approved by UL/C-UL, CE
- Inrush current limit
- Over current protection
- Over voltage protection
- Complies with FCC Part15 and EN55022 Class A Limits
- 3 years warranty

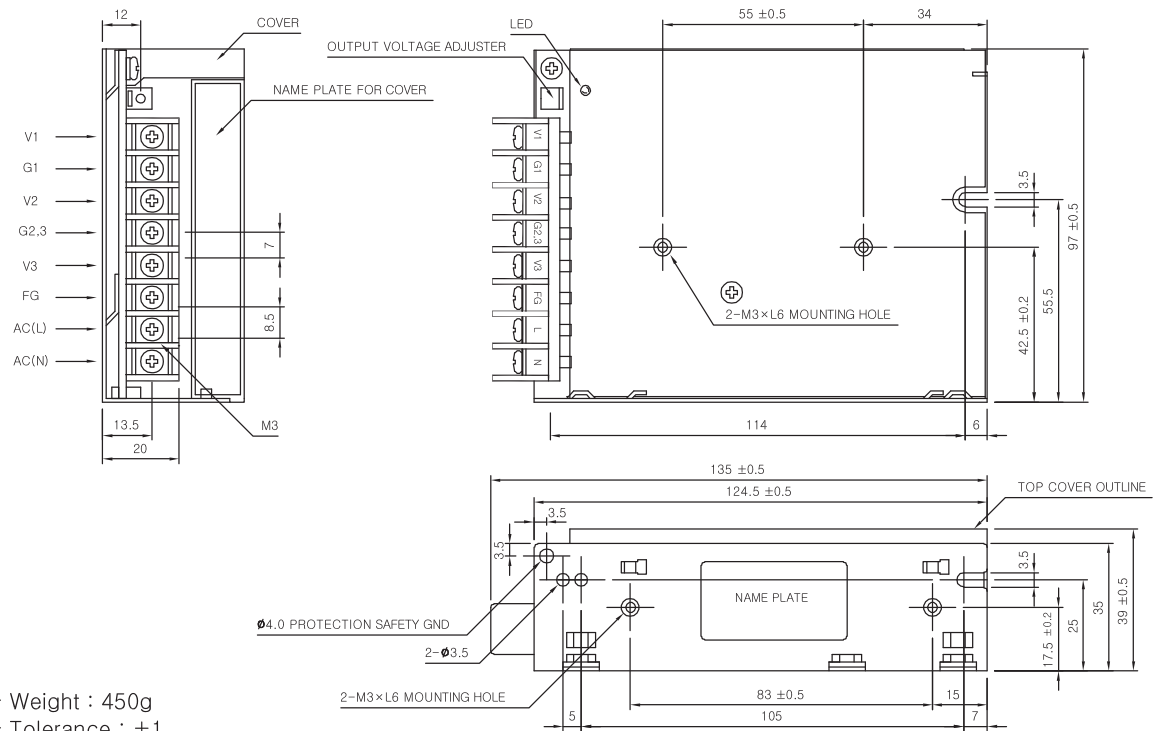


## MSF30-TRIPLE SPECIFICATIONS



|                       | MODEL                     |         | MSF30-BDB                                                                                           |                             |            | MSF30-DD     |          |            | MSF30-EE     |            |            |  |
|-----------------------|---------------------------|---------|-----------------------------------------------------------------------------------------------------|-----------------------------|------------|--------------|----------|------------|--------------|------------|------------|--|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-240V (AC85 ~ 264V or DC125 ~ 370V), 50/60Hz (47 ~ 440Hz) Universal Input.                     |                             |            |              |          |            |              |            |            |  |
|                       | CURRENT                   | [A]     | 110V                                                                                                | 1.0 ( I <sub>o</sub> =100%) |            |              |          |            |              |            |            |  |
|                       |                           |         | 220V                                                                                                | 0.6 ( I <sub>o</sub> =100%) |            |              |          |            |              |            |            |  |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                | 70 typ                      |            |              | 70 typ   |            |              | 70 typ     |            |  |
|                       |                           |         | 220V                                                                                                |                             |            |              |          |            |              |            |            |  |
| INRUSH CURRENT        |                           |         | 20A typ(AC IN 110V, I <sub>o</sub> =100%), 40A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start. |                             |            |              |          |            |              |            |            |  |
| OUTPUT                | VOLTAGE                   | [V]     | 5                                                                                                   | 12                          | -5         | 5            | 12       | -12        | 5            | 15         | -15        |  |
|                       | CURRENT                   | [A]     | 0.6 ~ 3                                                                                             | 0.3 ~ 1                     | 0.15 ~ 0.5 | 0.6 ~ 3      | 0.3 ~ 1  | 0.15 ~ 0.5 | 0.6 ~ 3      | 0.15 ~ 0.5 | 0.15 ~ 0.5 |  |
|                       | REGULATIONS               | [mV]    | 50 Max                                                                                              | 120 Max                     | 50 Max     | 50 Max       | 120 Max  | 120 Max    | 50 Max       | 150 Max    | 150 Max    |  |
|                       | REGULATIONS               | [mV]    | 100 Max                                                                                             | 1200 Max                    | 500 Max    | 100 Max      | 1200 Max | 1200 Max   | 100 Max      | 1500 Max   | 1500 Max   |  |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                              | 120 Max                     | 50 Max     | 50 Max       | 120 Max  | 120 Max    | 50 Max       | 150 Max    | 150 Max    |  |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                             | 170 Max                     | 100 Max    | 100 Max      | 170 Max  | 170 Max    | 100 Max      | 200 Max    | 200 Max    |  |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 75 Max                                                                                              | 180 Max                     | 75 Max     | 75 Max       | 180 Max  | 180 Max    | 75 Max       | 225 Max    | 225 Max    |  |
|                       | RISE TIME                 | [ms]    | 1000 max (AC IN 85V, I <sub>o</sub> =100%)                                                          |                             |            |              |          |            |              |            |            |  |
|                       | HOLDING TIME              | [ms]    | 16 typ (AC IN 85V, I <sub>o</sub> =100%)                                                            |                             |            |              |          |            |              |            |            |  |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                             |                             |            |              |          |            |              |            |            |  |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating                                                                       |                             |            |              |          |            |              |            |            |  |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                     |                             |            |              |          |            |              |            |            |  |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                     |                             |            |              |          |            |              |            |            |  |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                      |                             |            |              |          |            |              |            |            |  |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                            |                             |            |              |          |            |              |            |            |  |
|                       | STORAGE TEMP AND HUMID    |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                            |                             |            |              |          |            |              |            |            |  |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                 |                             |            |              |          |            |              |            |            |  |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                           |                             |            |              |          |            |              |            |            |  |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                        |                             |            | UL, C-UL, CE |          |            | UL, C-UL, CE |            |            |  |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                 |                             |            |              |          |            |              |            |            |  |

## MSF30-TRIPLE EXTERNAL VIEW



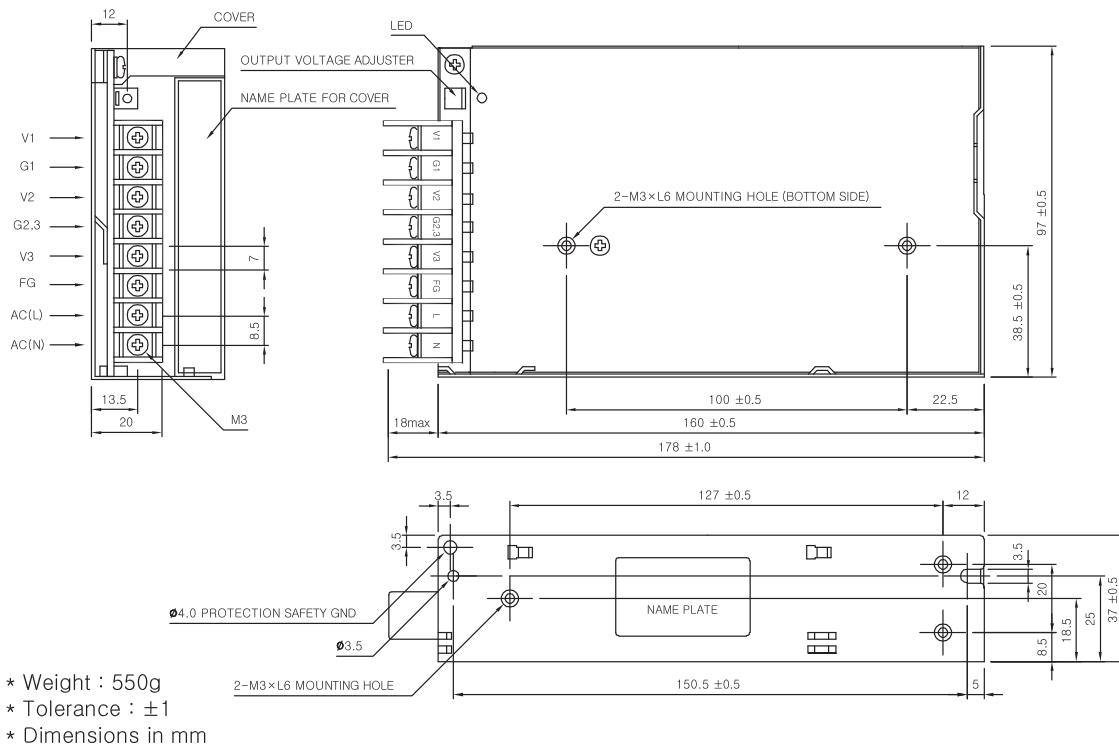
- \* Weight : 450g
- \* Tolerance : ±1
- \* Dimensions in mm

## MSF50-TRIPLE SPECIFICATIONS



|                       | MODEL                     |         | MSF50-BDB                                                                                           |                              |            | MSF50-DD     |          |          | MSF50-EE     |          |          | MSF50-BDH    |          |          |  |
|-----------------------|---------------------------|---------|-----------------------------------------------------------------------------------------------------|------------------------------|------------|--------------|----------|----------|--------------|----------|----------|--------------|----------|----------|--|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-240V (AC85 ~ 264V or DC110 ~ 370V), 50/60Hz (43 ~ 440Hz) Universal Input.                     |                              |            |              |          |          |              |          |          |              |          |          |  |
|                       | CURRENT                   | [A]     | 110V                                                                                                | 1.5 ( I <sub>o</sub> =100%)  |            |              |          |          |              |          |          |              |          |          |  |
|                       |                           |         | 220V                                                                                                | 0.75 ( I <sub>o</sub> =100%) |            |              |          |          |              |          |          |              |          |          |  |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                | 72 typ                       |            |              | 72 typ   |          |              | 72 typ   |          |              | 72 typ   |          |  |
|                       |                           |         | 220V                                                                                                |                              |            |              |          |          |              |          |          |              |          |          |  |
| INRUSH CURRENT        |                           |         | 20A typ(AC IN 110V, I <sub>o</sub> =100%), 40A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start. |                              |            |              |          |          |              |          |          |              |          |          |  |
| OUTPUT                | VOLTAGE                   | [V]     | 5                                                                                                   | 12                           | -5         | 5            | 12       | -12      | 5            | 15       | -15      | 5            | 12       | 24       |  |
|                       | CURRENT                   | [A]     | 1.4 ~ 7                                                                                             | 0.3 ~ 1                      | 0.15 ~ 0.5 | 1 ~ 5        | 0.3 ~ 1  | 0.3 ~ 1  | 0.8 ~ 4      | 0.3 ~ 1  | 0.3 ~ 1  | 0.6 ~ 3      | 0.3 ~ 1  | 0.3 ~ 1  |  |
|                       | REGULATIONS, LINE         | [mV]    | 100 Max                                                                                             | 1200 Max                     | 500 Max    | 100 Max      | 1200 Max | 1200 Max | 100 Max      | 1500 Max | 1500 Max | 100 Max      | 1200 Max | 2400 Max |  |
|                       | REGULATIONS, LOAD         | [mV]    | 100 Max                                                                                             | 1200 Max                     | 500 Max    | 100 Max      | 1200 Max | 1200 Max | 100 Max      | 1500 Max | 1500 Max | 100 Max      | 1200 Max | 2400 Max |  |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                              | 120 Max                      | 50 Max     | 50 Max       | 120 Max  | 120 Max  | 50 Max       | 150 Max  | 150 Max  | 50 Max       | 120 Max  | 240 Max  |  |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                             | 170 Max                      | 100 Max    | 100 Max      | 170 Max  | 170 Max  | 100 Max      | 200 Max  | 200 Max  | 100 Max      | 170 Max  | 290 Max  |  |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 75 Max                                                                                              | 180 Max                      | 75 Max     | 75 Max       | 180 Max  | 180 Max  | 75 Max       | 225 Max  | 225 Max  | 75 Max       | 180 Max  | 360 Max  |  |
|                       | RISE TIME                 | [ms]    | 1000 max (AC IN 110V, I <sub>o</sub> =100%)                                                         |                              |            |              |          |          |              |          |          |              |          |          |  |
|                       | HOLDING TIME              | [ms]    | 16 typ (AC IN 110V, I <sub>o</sub> =100%)                                                           |                              |            |              |          |          |              |          |          |              |          |          |  |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                             |                              |            |              |          |          |              |          |          |              |          |          |  |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating                                                                       |                              |            |              |          |          |              |          |          |              |          |          |  |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                     |                              |            |              |          |          |              |          |          |              |          |          |  |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                     |                              |            |              |          |          |              |          |          |              |          |          |  |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                      |                              |            |              |          |          |              |          |          |              |          |          |  |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                            |                              |            |              |          |          |              |          |          |              |          |          |  |
|                       | STORAGE TEMP AND HUMID    |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                            |                              |            |              |          |          |              |          |          |              |          |          |  |
|                       | VIBRATION                 |         | 10~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                  |                              |            |              |          |          |              |          |          |              |          |          |  |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                           |                              |            |              |          |          |              |          |          |              |          |          |  |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                        |                              |            | UL, C-UL, CE |          |          | UL, C-UL, CE |          |          | UL, C-UL, CE |          |          |  |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                 |                              |            |              |          |          |              |          |          |              |          |          |  |

## MSF50-TRIPLE EXTERNAL VIEW

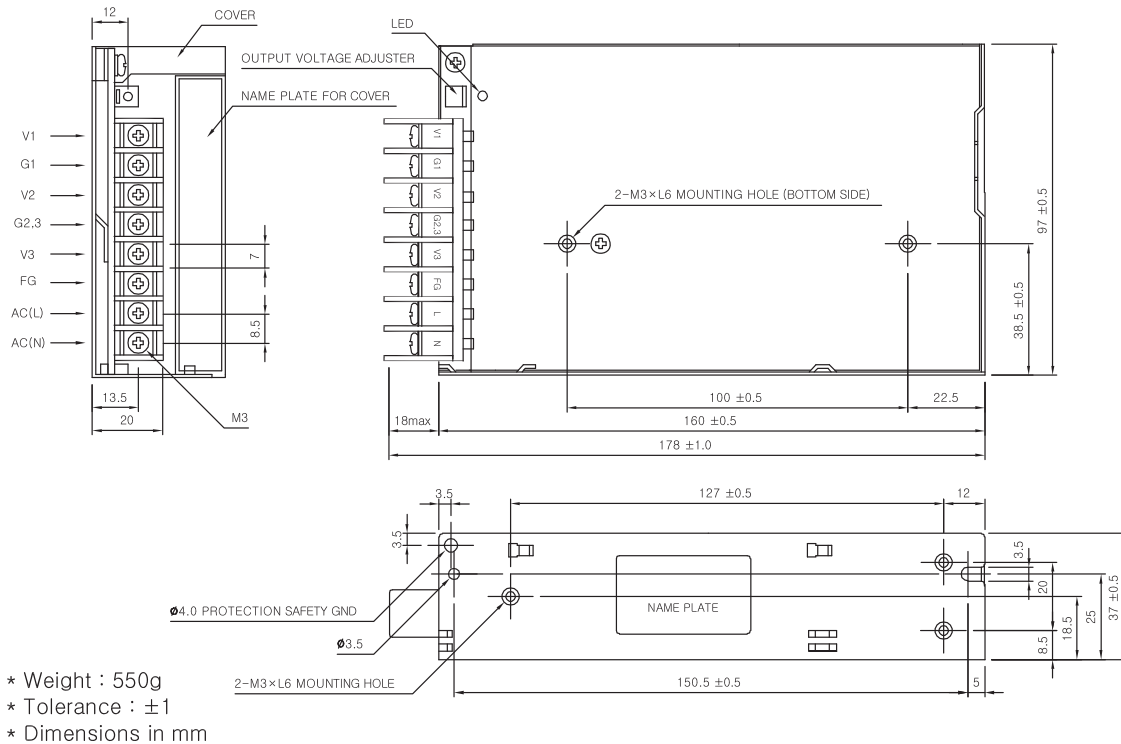


## MSF60-TRIPLE SPECIFICATIONS



|                       | MODEL                     |         | MSF60-BDB                                                                                           |                             |            | MSF60-DD     |            |            | MSF60-EE     |          |            | MSF60-BDH    |          |          |  |
|-----------------------|---------------------------|---------|-----------------------------------------------------------------------------------------------------|-----------------------------|------------|--------------|------------|------------|--------------|----------|------------|--------------|----------|----------|--|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-240V (AC85 ~ 264V or DC110 ~ 370V), 50/60Hz (47 ~ 440Hz) Universal Input.                     |                             |            |              |            |            |              |          |            |              |          |          |  |
|                       | CURRENT                   | [A]     | 110V                                                                                                | 1.9 ( I <sub>o</sub> =100%) |            |              |            |            |              |          |            |              |          |          |  |
|                       |                           |         | 220V                                                                                                | 0.9 ( I <sub>o</sub> =100%) |            |              |            |            |              |          |            |              |          |          |  |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                | 75 typ                      |            |              | 75 typ     |            |              | 75 typ   |            |              | 75 typ   |          |  |
|                       |                           |         | 220V                                                                                                |                             |            |              |            |            |              |          |            |              |          |          |  |
| INRUSH CURRENT        |                           |         | 20A typ(AC IN 110V, I <sub>o</sub> =100%), 40A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start. |                             |            |              |            |            |              |          |            |              |          |          |  |
| OUTPUT                | VOLTAGE                   | [V]     | 5                                                                                                   | 12                          | -5         | 5            | 12         | -12        | 5            | 15       | -15        | 5            | 12       | 24       |  |
|                       | CURRENT                   | [A]     | 1 ~ 5                                                                                               | 0.75 ~ 2.5                  | 0.15 ~ 0.5 | 1 ~ 5        | 0.75 ~ 2.5 | 0.15 ~ 0.5 | 1 ~ 5        | 0.6 ~ 2  | 0.15 ~ 0.5 | 1 ~ 5        | 0.3 ~ 1  | 0.3 ~ 1  |  |
|                       | REGULATIONS, LINE         | [mV]    | 100 Max                                                                                             | 1200 Max                    | 500 Max    | 100 Max      | 1200 Max   | 1200 Max   | 100 Max      | 1500 Max | 1500 Max   | 100 Max      | 1200 Max | 2400 Max |  |
|                       | REGULATIONS, LOAD         | [mV]    | 100 Max                                                                                             | 1200 Max                    | 500 Max    | 100 Max      | 1200 Max   | 1200 Max   | 100 Max      | 1500 Max | 1500 Max   | 100 Max      | 1200 Max | 2400 Max |  |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                              | 120 Max                     | 50 Max     | 50 Max       | 120 Max    | 120 Max    | 50 Max       | 150 Max  | 150 Max    | 50 Max       | 120 Max  | 240 Max  |  |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                             | 170 Max                     | 100 Max    | 100 Max      | 170 Max    | 170 Max    | 100 Max      | 200 Max  | 200 Max    | 100 Max      | 170 Max  | 290 Max  |  |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 75 Max                                                                                              | 180 Max                     | 75 Max     | 75 Max       | 180 Max    | 180 Max    | 75 Max       | 225 Max  | 225 Max    | 75 Max       | 180 Max  | 360 Max  |  |
|                       | RISE TIME                 | [ms]    | 1000 max (AC IN 110V, I <sub>o</sub> =100%)                                                         |                             |            |              |            |            |              |          |            |              |          |          |  |
|                       | HOLDING TIME              | [ms]    | 16 typ (AC IN 110V, I <sub>o</sub> =100%)                                                           |                             |            |              |            |            |              |          |            |              |          |          |  |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                             |                             |            |              |            |            |              |          |            |              |          |          |  |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115 ~ 140% of rating                                                                       |                             |            |              |            |            |              |          |            |              |          |          |  |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                     |                             |            |              |            |            |              |          |            |              |          |          |  |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                     |                             |            |              |            |            |              |          |            |              |          |          |  |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                      |                             |            |              |            |            |              |          |            |              |          |          |  |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                            |                             |            |              |            |            |              |          |            |              |          |          |  |
|                       | STORAGE TEMP AND HUMID    |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                            |                             |            |              |            |            |              |          |            |              |          |          |  |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                 |                             |            |              |            |            |              |          |            |              |          |          |  |
|                       | IMPACT                    |         | 10G for 20ms, Once on each X, Y and Z axis                                                          |                             |            |              |            |            |              |          |            |              |          |          |  |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                        |                             |            | UL, C-UL, CE |            |            | UL, C-UL, CE |          |            | UL, C-UL, CE |          |          |  |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                 |                             |            |              |            |            |              |          |            |              |          |          |  |

## MSF60-TRIPLE EXTERNAL VIEW

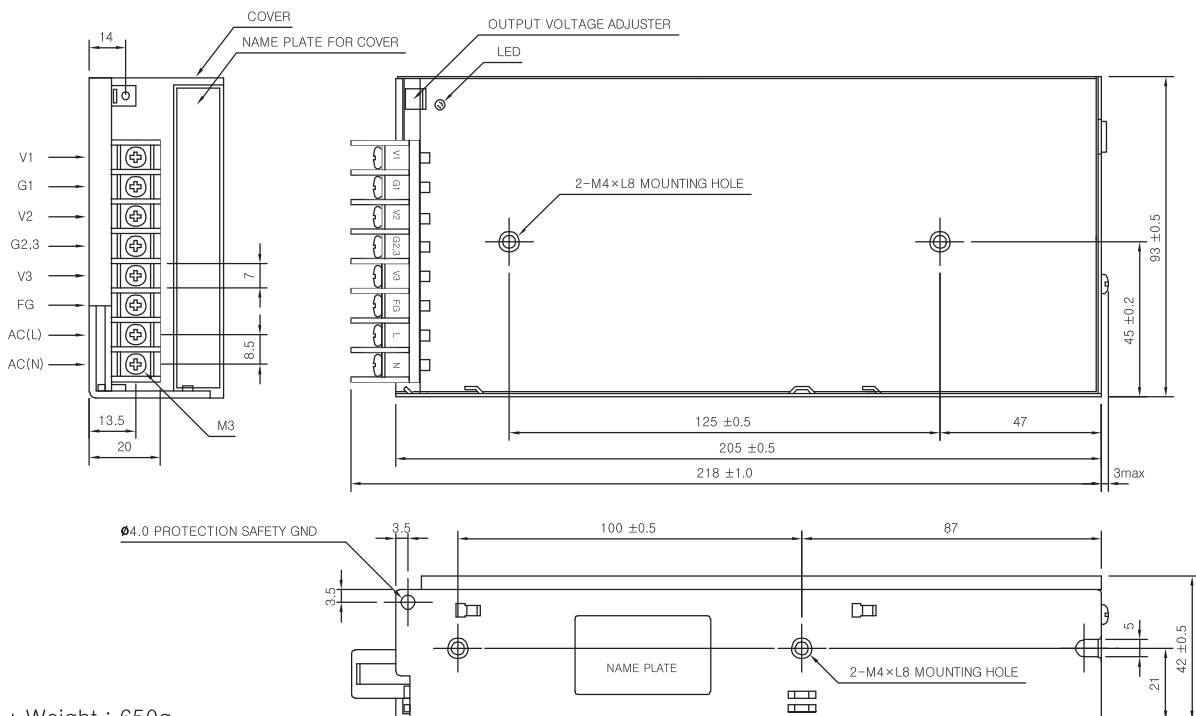


## MSF80-TRIPLE SPECIFICATIONS



|                       | MODEL                     |         | MSF80-BDB                                                                                               |                             |            | MSF80-DD     |          |          | MSF80-EE     |            |          | MSF80-BHD    |            |          |  |
|-----------------------|---------------------------|---------|---------------------------------------------------------------------------------------------------------|-----------------------------|------------|--------------|----------|----------|--------------|------------|----------|--------------|------------|----------|--|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-120V / 200-240V (AC90 ~ 132V / 180 ~ 264V or DC240 ~ 370V), 50/60Hz (47 ~ 440Hz) User Selectable. |                             |            |              |          |          |              |            |          |              |            |          |  |
|                       | CURRENT                   | [A]     | 110V                                                                                                    | 2.0 ( I <sub>c</sub> =100%) |            |              |          |          |              |            |          |              |            |          |  |
|                       |                           |         | 220V                                                                                                    | 1.1 ( I <sub>c</sub> =100%) |            |              |          |          |              |            |          |              |            |          |  |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                    | 75 typ                      |            |              | 75 typ   |          |              | 75 typ     |          |              | 75 typ     |          |  |
|                       |                           |         | 220V                                                                                                    |                             |            |              |          |          |              |            |          |              |            |          |  |
| INRUSH CURRENT        |                           |         | 20A typ (AC IN 110V, I <sub>c</sub> =100%), 40A typ(AC IN 220V, I <sub>c</sub> =100%) at cold start.    |                             |            |              |          |          |              |            |          |              |            |          |  |
| OUTPUT                | VOLTAGE                   | [V]     | 5                                                                                                       | 12                          | -5         | 5            | 12       | -12      | 5            | 15         | -15      | 5            | 24         | 12       |  |
|                       | CURRENT                   | [A]     | 1.8 ~ 9                                                                                                 | 0.75 ~ 2.5                  | 0.15 ~ 0.5 | 1.8 ~ 9      | 0.6 ~ 2  | 0.3 ~ 1  | 1.7 ~ 8.5    | 0.45 ~ 1.5 | 0.3 ~ 1  | 0.8 ~ 4      | 0.45 ~ 1.5 | 0.6 ~ 2  |  |
|                       | REGULATIONS, LINE         | [mV]    | 100 Max                                                                                                 | 1200 Max                    | 500 Max    | 100 Max      | 1200 Max | 1200 Max | 100 Max      | 1500 Max   | 1500 Max | 100 Max      | 1200 Max   | 2400 Max |  |
|                       | REGULATIONS, LOAD         | [mV]    | 100 Max                                                                                                 | 1200 Max                    | 500 Max    | 100 Max      | 1200 Max | 1200 Max | 100 Max      | 1500 Max   | 1500 Max | 100 Max      | 1200 Max   | 2400 Max |  |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                                  | 120 Max                     | 50 Max     | 50 Max       | 120 Max  | 120 Max  | 50 Max       | 150 Max    | 150 Max  | 50 Max       | 240 Max    | 120 Max  |  |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                                 | 170 Max                     | 100 Max    | 100 Max      | 170 Max  | 170 Max  | 100 Max      | 200 Max    | 200 Max  | 100 Max      | 290 Max    | 170 Max  |  |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 75 Max                                                                                                  | 180 Max                     | 75 Max     | 75 Max       | 180 Max  | 180 Max  | 75 Max       | 225 Max    | 225 Max  | 75 Max       | 360 Max    | 180 Max  |  |
|                       | RISE TIME                 | [ms]    | 1000 max (AC IN 110V, I <sub>c</sub> =100%)                                                             |                             |            |              |          |          |              |            |          |              |            |          |  |
|                       | HOLDING TIME              | [ms]    | 10 typ (AC IN 110V, I <sub>c</sub> =100%)                                                               |                             |            |              |          |          |              |            |          |              |            |          |  |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                                 |                             |            |              |          |          |              |            |          |              |            |          |  |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 120~150% of rating                                                                             |                             |            |              |          |          |              |            |          |              |            |          |  |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |            |              |          |          |              |            |          |              |            |          |  |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                         |                             |            |              |          |          |              |            |          |              |            |          |  |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                          |                             |            |              |          |          |              |            |          |              |            |          |  |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                                |                             |            |              |          |          |              |            |          |              |            |          |  |
|                       | STORAGE TEMP AND HUMID    |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                                |                             |            |              |          |          |              |            |          |              |            |          |  |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                     |                             |            |              |          |          |              |            |          |              |            |          |  |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                               |                             |            |              |          |          |              |            |          |              |            |          |  |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                            |                             |            | UL, C-UL, CE |          |          | UL, C-UL, CE |            |          | UL, C-UL, CE |            |          |  |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                     |                             |            |              |          |          |              |            |          |              |            |          |  |

## MSF80-TRIPLE EXTERNAL VIEW



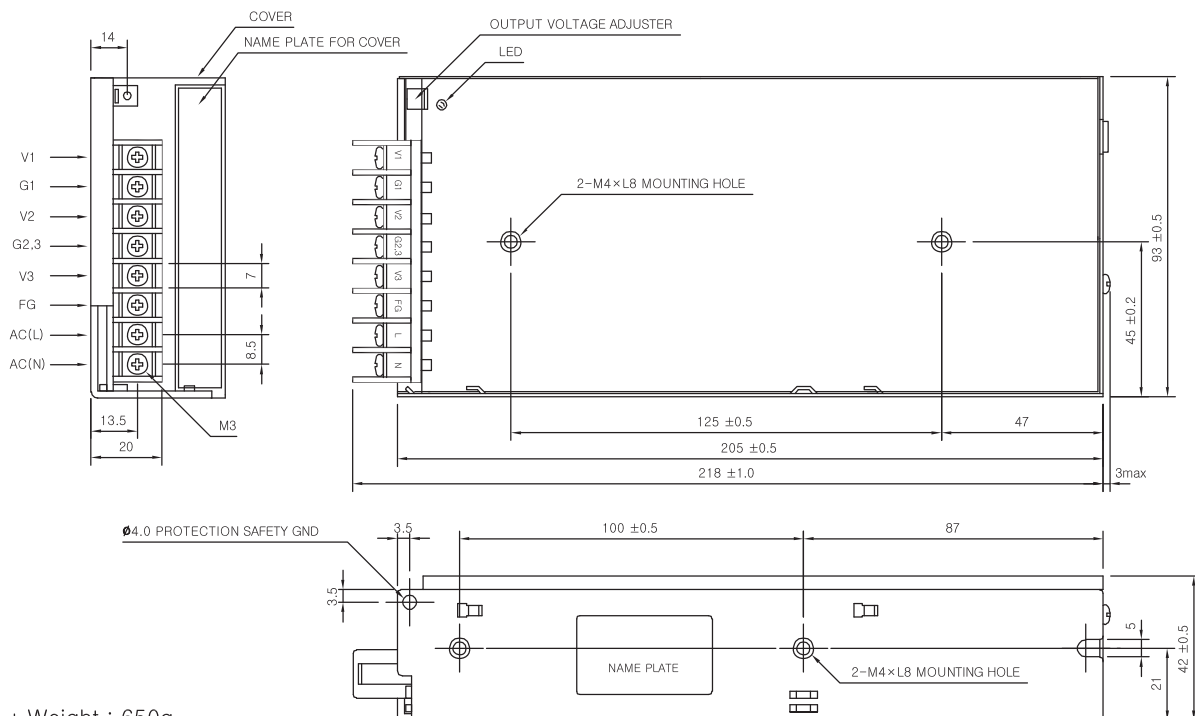
- \* Weight : 650g
- \* Tolerance : ±1
- \* Dimensions in mm

## MSF100-TRIPLE SPECIFICATIONS



|                       | MODEL                     |         | MSF100-BDB                                                                                                |                             |         | MSF100-BDD   |          |          | MSF100-EE    |            |          | MSF100-BHD   |          |          |  |
|-----------------------|---------------------------|---------|-----------------------------------------------------------------------------------------------------------|-----------------------------|---------|--------------|----------|----------|--------------|------------|----------|--------------|----------|----------|--|
| INPUT                 | VOLTAGE, FREQUENCY        |         | AC100-120V / 200 ~ 240V (AC90 ~ 132V / 180 ~ 264V or DC240 ~ 370V), 50/60Hz (47 ~ 440Hz) User Selectable. |                             |         |              |          |          |              |            |          |              |          |          |  |
|                       | CURRENT                   | [A]     | 110V                                                                                                      | 2.4 ( I <sub>o</sub> =100%) |         |              |          |          |              |            |          |              |          |          |  |
|                       |                           |         | 220V                                                                                                      | 1.4 ( I <sub>o</sub> =100%) |         |              |          |          |              |            |          |              |          |          |  |
|                       | EFFICIENCY                | [%]     | 110V                                                                                                      | 75 typ                      |         |              | 75 typ   |          |              | 75 typ     |          |              | 75 typ   |          |  |
|                       |                           |         | 220V                                                                                                      |                             |         |              |          |          |              |            |          |              |          |          |  |
| INRUSH CURRENT        |                           |         | 20A typ (AC IN 110V, I <sub>o</sub> =100%), 40A typ(AC IN 220V, I <sub>o</sub> =100%) at cold start.      |                             |         |              |          |          |              |            |          |              |          |          |  |
| OUTPUT                | VOLTAGE                   | [V]     | 5                                                                                                         | 12                          | -5      | 5            | 12       | -12      | 5            | 15         | -15      | 5            | 24       | 12       |  |
|                       | CURRENT                   | [A]     | 2.6 ~ 13                                                                                                  | 0.6 ~ 2                     | 0.6 ~ 2 | 2.6 ~ 13     | 0.6 ~ 2  | 0.3 ~ 1  | 2.6 ~ 13     | 0.45 ~ 1.5 | 0.3 ~ 1  | 1.2 ~ 6      | 0.6 ~ 2  | 0.6 ~ 2  |  |
|                       | REGULATIONS, LINE         | [mV]    | 100 Max                                                                                                   | 1200 Max                    | 500 Max | 100 Max      | 1200 Max | 1200 Max | 100 Max      | 1500 Max   | 1500 Max | 100 Max      | 1200 Max | 2400 Max |  |
|                       | REGULATIONS, LOAD         | [mV]    | 100 Max                                                                                                   | 1200 Max                    | 500 Max | 100 Max      | 1200 Max | 1200 Max | 100 Max      | 1500 Max   | 1500 Max | 100 Max      | 1200 Max | 2400 Max |  |
|                       | RIPPLE                    | [mVp-p] | 50 Max                                                                                                    | 120 Max                     | 50 Max  | 50 Max       | 120 Max  | 120 Max  | 50 Max       | 150 Max    | 150 Max  | 50 Max       | 240 Max  | 120 Max  |  |
|                       | RIPPLE, NOISE             | [mVp-p] | 100 Max                                                                                                   | 170 Max                     | 100 Max | 100 Max      | 170 Max  | 170 Max  | 100 Max      | 200 Max    | 200 Max  | 100 Max      | 290 Max  | 170 Max  |  |
|                       | TEMPERATURE DRIFT 0~+50°C | [mV]    | 75 Max                                                                                                    | 180 Max                     | 75 Max  | 75 Max       | 180 Max  | 180 Max  | 75 Max       | 225 Max    | 225 Max  | 75 Max       | 360 Max  | 180 Max  |  |
|                       | RISE TIME                 | [ms]    | 1000 max (AC IN 110V, I <sub>o</sub> =100%)                                                               |                             |         |              |          |          |              |            |          |              |          |          |  |
|                       | HOLDING TIME              | [ms]    | 10 typ (AC IN 110V, I <sub>o</sub> =100%)                                                                 |                             |         |              |          |          |              |            |          |              |          |          |  |
| PROTECTION CIRCUIT    | OVER CURRENT PROTECTION   |         | Works at over 110% of rating and recovers automatically                                                   |                             |         |              |          |          |              |            |          |              |          |          |  |
|                       | OVER VOLTAGE PROTECTION   |         | Works at 115~ 140% of rating                                                                              |                             |         |              |          |          |              |            |          |              |          |          |  |
| ELECTRICALLY ISOLATED | INPUT-OUTPUT              |         | AC 3,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                           |                             |         |              |          |          |              |            |          |              |          |          |  |
|                       | INPUT-CASE, FG            |         | AC 2,000V 1 minute current 20mA, DC 500V 100MΩ (At room temperature & Humidity)                           |                             |         |              |          |          |              |            |          |              |          |          |  |
|                       | OUTPUT-CASE, FG           |         | AC 500V 1 minute current 100mA, DC 500V 100MΩ (At room temperature & Humidity)                            |                             |         |              |          |          |              |            |          |              |          |          |  |
| ENVIRONMENT           | OPERATING TEMP AND HUMID  |         | -10 ~ +50°C, 20 ~ 90% RH(Non condensing)                                                                  |                             |         |              |          |          |              |            |          |              |          |          |  |
|                       | STORAGE TEMP AND HUMID    |         | -20 ~ +75°C, 20 ~ 90% RH(Non condensing)                                                                  |                             |         |              |          |          |              |            |          |              |          |          |  |
|                       | VIBRATION                 |         | 10 ~ 55Hz at 1G, 3 minutes period, 30 minutes along X, Y and Z axis                                       |                             |         |              |          |          |              |            |          |              |          |          |  |
|                       | IMPACT                    |         | 10G for 20ms once on each X, Y and Z axis                                                                 |                             |         |              |          |          |              |            |          |              |          |          |  |
| SAFETY                | SAFETY REGULATION         |         | UL, C-UL, CE                                                                                              |                             |         | UL, C-UL, CE |          |          | UL, C-UL, CE |            |          | UL, C-UL, CE |          |          |  |
|                       | LINE CONDUCTED RF VOLTAGE |         | Complied with FCC Part15 and EN55022 Class A Limits                                                       |                             |         |              |          |          |              |            |          |              |          |          |  |

## MSF100-TRIPLE EXTERNAL VIEW



- \* Weight : 650g
- \* Tolerance : ±1
- \* Dimensions in mm

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