

# Power Supplies

AC Input  
Single Output, General-Purpose

## FMP, FMP-B Series

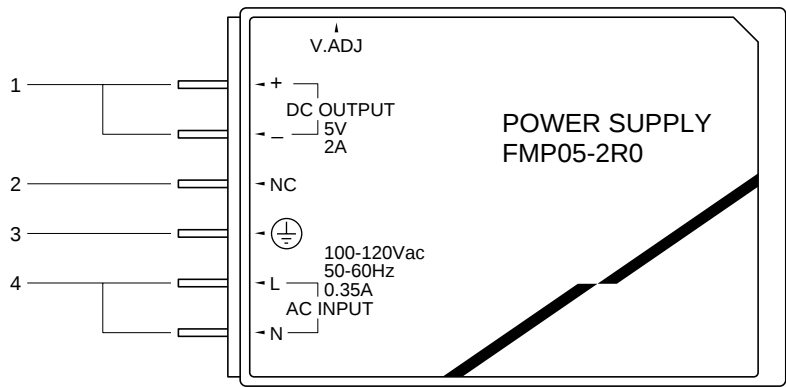
### FEATURES

- Economical due to plastic case.
- FMP-B has pin terminals for board mounting.
- These low noise power supplies are FCC class B compliant.

### PART NUMBERS AND RATINGS

| Output voltage(V) | 3W type      |            | 10W type     |            |
|-------------------|--------------|------------|--------------|------------|
|                   | Current(A)   | Part No.   | Current(A)   | Part No.   |
| 5                 | 0.06 to 0.6  | FMP05-R60  | 0.2 to 2     | FMP05-2R0  |
|                   |              | FMP05-R60B |              | FMP05-2R0B |
| 12                | 0.02 to 0.25 | FMP12-R25  | 0.08 to 0.85 | FMP12-R85  |
|                   |              | FMP12-R25B |              | FMP12-R85B |
| 15                | 0.02 to 0.2  | FMP15-R20  | 0.07 to 0.7  | FMP15-R70  |
|                   |              | FMP15-R20B |              | FMP15-R70B |
| 24                | 0.01 to 0.13 | FMP24-R13  | 0.04 to 0.45 | FMP24-R45  |
|                   |              | FMP24-R13B |              | FMP24-R45B |

### TERMINAL DESIGNATIONS AND FUNCTIONS



- Terminal No. 1: DC output terminals(+, -)  
Connect to load.
- Terminal No. 2: No connection(NC)  
Unconnected terminal. This should not be connected.
- Terminal No. 3: Ground terminal( $\perp$ )  
For input line.
- Terminal No. 4: AC input terminals(L, N, AC INPUT)  
Connect to AC.100 to 120V single phase power supply.



# Power Supplies

## FMP, FMP-B Series

AC Input

Single Output, General-Purpose

### SPECIFICATIONS

#### 3W TYPE

| Part No.                                  |                       | FMP05-R60* <sup>1</sup><br>FMP05-R60B* <sup>1</sup>                   | FMP12-R25<br>FMP12-R25B                                                       | FMP15-R20<br>FMP15-R20B | FMP24-R13<br>FMP24-R13B |
|-------------------------------------------|-----------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------|-------------------------|
| Output voltage, current * <sup>2</sup>    |                       | 5V • 0.6A                                                             | 12V • 0.25A                                                                   | 15V • 0.2A              | 24V • 0.13A             |
| Maximum output power                      | W                     | 3                                                                     | 3                                                                             | 3                       | 3.1                     |
| Input requirements                        |                       |                                                                       |                                                                               |                         |                         |
| Input voltage Eac                         | V                     | 85 to 132[Rating: 100-120]                                            |                                                                               |                         |                         |
| Input frequency                           | Hz                    | 47 to 440[Single phase]                                               |                                                                               |                         |                         |
| Input current                             | A                     | 0.08typ.[85V, 25°C, input and output ratings](Output rating: 0.1max.) |                                                                               |                         |                         |
| Surge current                             | A                     | 16max.[25°C, input and output ratings, cold start]                    |                                                                               |                         |                         |
| Leakage current                           | mA                    | 0.5max.[25°C, input and output ratings]                               |                                                                               |                         |                         |
| Efficiency                                | %                     | 68typ.                                                                | 70typ.                                                                        | 70typ.                  | 74typ.                  |
| Output characteristics                    |                       |                                                                       |                                                                               |                         |                         |
| Output voltage                            | V                     | 5                                                                     | 12                                                                            | 15                      | 24                      |
| Voltage variable range                    | V                     | 4.5 to 5.5                                                            | 10.8 to 13.2                                                                  | 13.5 to 16.5            | 21.6 to 26.4            |
| Maximum output current* <sup>2</sup>      | A                     | 0.6                                                                   | 0.25                                                                          | 0.2                     | 0.13                    |
| Minimum output current* <sup>3</sup>      | A                     | 0.06                                                                  | 0.02                                                                          | 0.02                    | 0.01                    |
| Overcurrent threshold                     | A                     | 0.7 to 1.2                                                            | 0.3 to 0.5                                                                    | 0.25 to 0.4             | 0.15 to 0.3             |
| Voltage stability                         | Input variation       | %                                                                     | 0.1typ.[Within the input voltage range]                                       |                         |                         |
|                                           | Load variation        | %                                                                     | 0.8typ.[10 to 100% load]                                                      |                         |                         |
|                                           | Temperature variation | %                                                                     | 1typ.[0 to +50°C]                                                             |                         |                         |
|                                           | Drift                 | %                                                                     | 1max.[25°C, input and output ratings, after input voltage ON for 30min to 8h] |                         |                         |
|                                           | Dynamic load          | %/ms                                                                  | ±4max./1max.[50 to 100% sudden load change]                                   |                         |                         |
| Ripple Ep-p                               | mV                    | 50max.                                                                | 80max.                                                                        | 80max.                  | 100max.                 |
| Ripple noise Ep-p                         | mV                    | 100max.                                                               | 150max.                                                                       | 150max.                 | 150max.                 |
| Start up time                             | ms                    | 100max.                                                               |                                                                               |                         |                         |
| Hold up time                              | ms                    | 20min.                                                                |                                                                               |                         |                         |
| Accessory equipment                       |                       |                                                                       |                                                                               |                         |                         |
| Operation indicator                       |                       | None                                                                  |                                                                               |                         |                         |
| Overvoltage protection                    |                       | Uses overvoltage prevention* <sup>4</sup>                             |                                                                               |                         |                         |
| Overcurrent protection                    |                       | Fixed voltage threshold type, automatic recovery.                     |                                                                               |                         |                         |
| Remote ON-OFF                             |                       | None                                                                  |                                                                               |                         |                         |
| Remote sensing                            |                       | None                                                                  |                                                                               |                         |                         |
| Output voltage external variable function |                       | None                                                                  |                                                                               |                         |                         |
| Standards                                 |                       |                                                                       |                                                                               |                         |                         |
| Safety standards                          |                       | UL478, CSA ELECTRICAL BULLETIN No.1402 approved.                      |                                                                               |                         |                         |
| Noise terminal voltage                    |                       | FCC class B compliant.                                                |                                                                               |                         |                         |
| Construction                              |                       |                                                                       |                                                                               |                         |                         |
| External dimensions H×W×L                 | mm                    | 19×55×50[Except input and output terminals]                           |                                                                               |                         |                         |
| Weight                                    | g                     | 80max.                                                                |                                                                               |                         |                         |
| Mounting method                           |                       | Can be attached to 1 side.                                            |                                                                               |                         |                         |
| Case material                             |                       | Nonflammable resin                                                    |                                                                               |                         |                         |
| Input and output cables                   |                       | None                                                                  |                                                                               |                         |                         |

\*1 Output may fail to come on when operated in series.

\*2 Current rating(maximum output current) is determined for 0 to +50°C. Derating is required when used outside this temperature range.

\*3 The output load variation is determined within the range set by the minimum output current and the maximum output current. Nominal values might possibly not be satisfied when output is below the minimum output current.

\*4 Although there is no built-in overvoltage protection circuit, the overvoltage prevention method is used for circuit design, thereby preventing overvoltage.

# Power Supplies

## FMP, FMP-B Series

AC Input

Single Output, General-Purpose

### SPECIFICATIONS

#### 10W TYPE

| Part No.                              |                       | FMP05-2R0* <sup>1</sup><br>FMP05-2R0B* <sup>1</sup>                     | FMP12-R85<br>FMP12-R85B                                                       | FMP15-R70<br>FMP15-R70B | FMP24-R45<br>FMP24-R45B |
|---------------------------------------|-----------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------|-------------------------|
| Output voltage, current* <sup>2</sup> |                       | 5V • 2A                                                                 | 12V • 0.85A                                                                   | 15V • 0.7A              | 24V • 0.45A             |
| Maximum output power                  | W                     | 10                                                                      | 10.2                                                                          | 10.5                    | 10.8                    |
| Input requirements                    |                       |                                                                         |                                                                               |                         |                         |
| Input voltage Eac                     | V                     | 85 to 132[Rating: 100-120]                                              |                                                                               |                         |                         |
| Input frequency                       | Hz                    | 47 to 440[Single phase]                                                 |                                                                               |                         |                         |
| Input current                         | A                     | 0.25typ.[85V, 25°C, input and output ratings](Output ratings: 0.35max.) |                                                                               |                         |                         |
| Surge current                         | A                     | 16max.[25°C, input and output ratings, cold start]                      |                                                                               |                         |                         |
| Leakage current                       | mA                    | 0.5max.[25°C, input and output ratings]                                 |                                                                               |                         |                         |
| Efficiency                            | %                     | 75typ.                                                                  | 78typ.                                                                        | 78typ.                  | 81typ.                  |
| Output characteristics                |                       |                                                                         |                                                                               |                         |                         |
| Output voltage                        | V                     | 5                                                                       | 12                                                                            | 15                      | 24                      |
| Voltage variable range                | V                     | 4.5 to 5.5                                                              | 10.8 to 13.2                                                                  | 13.5 to 16.5            | 21.6 to 26.4            |
| Maximum output current* <sup>2</sup>  | A                     | 2                                                                       | 0.85                                                                          | 0.7                     | 0.45                    |
| Minimum output current* <sup>3</sup>  | A                     | 0.2                                                                     | 0.08                                                                          | 0.07                    | 0.04                    |
| Overcurrent threshold                 | A                     | 2.2 to 3.3                                                              | 0.9 to 1.4                                                                    | 0.75 to 1.2             | 0.5 to 0.8              |
| Voltage stability                     | Input variation       | %                                                                       | 0.1typ.[Within the input voltage range]                                       |                         |                         |
|                                       | Load variation        | %                                                                       | 0.8typ.[10 to 100% load]                                                      |                         |                         |
|                                       | Temperature variation | %                                                                       | 1typ.[0 to +50°C]                                                             |                         |                         |
|                                       | Drift                 | %                                                                       | 1max.[25°C, input and output ratings, after input voltage ON for 30min to 8h] |                         |                         |
|                                       | Dynamic load          | %/ms                                                                    | ±4max./1max.[50 to 100% sudden load change]                                   |                         |                         |
| Ripple Ep-p                           | mV                    | 50max.                                                                  | 80max.                                                                        | 80max.                  | 100max.                 |
| Ripple noise Ep-p                     | mV                    | 100max.                                                                 | 150max.                                                                       | 150max.                 | 150max.                 |
| Start up time                         | ms                    | 100max.                                                                 |                                                                               |                         |                         |
| Hold up time                          | ms                    | 20min.                                                                  |                                                                               |                         |                         |
| Accessory equipment                   |                       |                                                                         |                                                                               |                         |                         |
| Operation indicator                   |                       | None                                                                    |                                                                               |                         |                         |
| Overvoltage protection                |                       | Uses overvoltage prevention* <sup>4</sup>                               |                                                                               |                         |                         |
| Overcurrent protection                |                       | Fixed voltage threshold type, automatic recovery.                       |                                                                               |                         |                         |
| Remote ON-OFF                         |                       | None                                                                    |                                                                               |                         |                         |
| Remote sensing                        |                       | None                                                                    |                                                                               |                         |                         |
| Output voltage external function      |                       | None                                                                    |                                                                               |                         |                         |
| Standards                             |                       |                                                                         |                                                                               |                         |                         |
| Safety standards                      |                       | UL478, CSA ELECTRICAL BULLETIN No.1402 approved.                        |                                                                               |                         |                         |
| Noise terminal voltage                |                       | FCC class B compliant.                                                  |                                                                               |                         |                         |
| Construction                          |                       |                                                                         |                                                                               |                         |                         |
| External dimensions H×W×L             | mm                    | 19×55×80[Except input and output terminals]                             |                                                                               |                         |                         |
| Weight                                | g                     | 100max.                                                                 |                                                                               |                         |                         |
| Mounting method                       |                       | Can be attached to 1 side.                                              |                                                                               |                         |                         |
| Case material                         |                       | Nonflammable resin                                                      |                                                                               |                         |                         |
| Input and output cables               |                       | None                                                                    |                                                                               |                         |                         |

\*<sup>1</sup> Output may fail to come on when operated in series.

\*<sup>2</sup> Current rating(maximum output current) is determined for 0 to +50°C. Derating is required when used outside this temperature range.

\*<sup>3</sup> The output load variation is determined within the range set by the minimum output current and the maximum output current. Nominal values might possibly not be satisfied when output is below the minimum output current.

\*<sup>4</sup> Although there is no built-in overvoltage protection circuit, the overvoltage prevention method is used for circuit design, thereby preventing overvoltage.