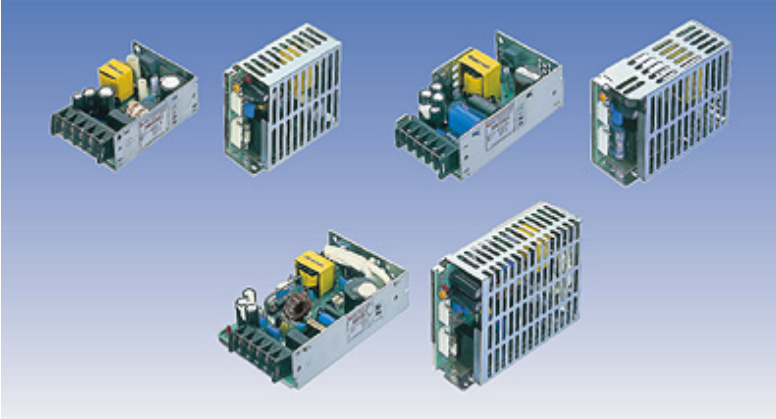


# 50 WATT AC-DC CONVERTER MRB-SB SERIES



## General Description

MR-Series has been developed as an alternative for WR/ER Series. This open frame switcher has excellent EMI-performance. It is safety approved, compact, and very cost effective.

## Features

1. Small size
2. High efficiency
3. Connectors: screw type (standard), molex optional

## Options

1. Case cover (Add suffix "-P" ex. MRB05SA-PU)
2. Connector type (Add suffix "-S")



| Specifications<AC/DC>             | Model                  |           |           |           |           |
|-----------------------------------|------------------------|-----------|-----------|-----------|-----------|
| <b>MRB**SB<br/>50WATTS/SINGLE</b> | MRB05SB-U              | MRB12SB-U | MRB15SB-U | MRB24SB-U | MRB48SB-U |
| <b>Input Characteristic</b>       |                        |           |           |           |           |
| Input Voltage                     | AC230V                 |           |           |           |           |
| Input Current                     | 1.1A                   |           |           |           |           |
| Input Range                       | AC170-264V(DC220-350V) |           |           |           |           |
| Input Frequency                   | 50/60Hz                |           |           |           |           |
| Input Frequency Range             | 47-440Hz               |           |           |           |           |
| Phase                             | Single                 |           |           |           |           |
| Inrush Current *1                 | 20A(maximum)at AC230V  |           |           |           |           |
| Efficiency [%] (typical) *2       | 79                     | 81        | 83        | 85        | 85        |

## MRB\*\*SB Specification

| Specifications<AC/DC>   | Model   |           |           |           |           |
|---|---|-----------|-----------|-----------|-----------|
|   | MRB05SB-U   | MRB12SB-U | MRB15SB-U | MRB24SB-U | MRB48SB-U |
| <b>MRB**SB<br/>50WATTS/SINGLE</b>                             |   |           |           |           |           |
| <b>Output Characteristic</b>                                  |   |           |           |           |           |
| Output Voltage [V]  | 5   | 12        | 15        | 24        | 48        |
| Output Current [A]  | 10.0  | 4.2       | 3.4       | 2.1       | 1.1       |
| Voltage Adjust Range  | +/- 10% of Rated Output Voltage(at no load within the input range)  |           |           |           |           |
| Ripple and Noise [mVp-p](maximum) *3                          | 150   | 220       | 250       | 340       | 580       |
| <b>Regulation</b>   |   |           |           |           |           |
| a.Statistic Line Regulation [mV](maximum)                     | 40  | 96        | 120       | 192       | 384       |
| b.Statistic Load Regulation [mV](maximum)                     | 50  | 120       | 150       | 240       | 480       |
| c.Temperature Coefficient *4                                  | 0.03%/°C  |           |           |           |           |
| d.Drift[mV](maximum) *5                                       | 40  | 75        | 90        | 135       | 255       |
| e.Dynamic Load Regulation [mV](typical) *6                    | 150   | 360       | 450       | 720       | 1440      |
| f.Recovery Time *6  | 0.3mS(Typical)  |           |           |           |           |
| Rise up time  | 500mS(maximum) at 25°Cand rated input/output  |           |           |           |           |
| Hold up time  | 20mS(minimum) at 25°Cand rated input/output   |           |           |           |           |
| <b>Functions</b>  |   |           |           |           |           |
| Overcurrent Protection $\geq 10\%$ of Rated Output Current[A] | Current Limiting with automatic recovery  |           |           |           |           |
|   | 11.0  | 4.62      | 3.74      | 2.31      | 1.21      |
| Overvoltage Protection $\geq 10\%$ of Rated Output Voltage[V] | output shutdown(to reset,leave 2minutes after shut-off)   |           |           |           |           |
|   | 5.50  | 13.2      | 16.5      | 26.4      | 52.8      |
| Remote Sense  | not available   |           |           |           |           |
| Remote On/Off   | not available   |           |           |           |           |
| <b>Environmental</b>  |   |           |           |           |           |
| Operating Temperature *7                                      | -5 to +50°Cenclosed type: -5 to +40°C   |           |           |           |           |
| Operating Humidity  | 30 to 85%RH(non-condensing)   |           |           |           |           |
| Storage Temperature   | -20 to +85°C  |           |           |           |           |
| Storage Humidity  | 10 to 85%RH(non-condensing)   |           |           |           |           |
| Withstanding Voltage  | Primary-Secondary AC3,000V for 1minute  |           |           |           |           |
|   | Primary-Frame Ground AC2,500V for 1minute   |           |           |           |           |
|   | Secondary-Frame Ground AC500V for 1minute   |           |           |           |           |
| Isolation Resistance  | Primary-Secondary-Frame Ground 50M $\Omega$ (minimum) by DC500V insulation tester   |           |           |           |           |
| Vibration   | 5-10Hz:10mm double amplitude,10-55Hz:19.6m/s <sup>2</sup> ,20minutes' period for 60minutes each along X,Y,Z axes(non-operating) |           |           |           |           |
| Shock   | 294m/s <sup>2</sup>   |           |           |           |           |
| Cooling   | Convection  |           |           |           |           |
| ? Leakage Current   | 1mA(maximum) at 25°Cated input/output and rated input frequency   |           |           |           |           |
| ? Conducted line noise  | Built to meet VDE0871 Class B   |           |           |           |           |
| ? Safety  | UL:UL1950   |           |           |           |           |
|   | C-UL:CSA C22.2 No.234(Level 3)  |           |           |           |           |
|   | VDE:EN60950,IEC950,VDE0805  |           |           |           |           |
| Weight (typical)  | 250g/enclosed type:300g   |           |           |           |           |
| ? MTBF [H]  | 600,000   |           |           |           |           |
| ? Switching Frequency[kHz](typical)                           | 140   |           |           |           |           |

Conditions:

\*1 at cold start

\*2 at DC260V input and rated output

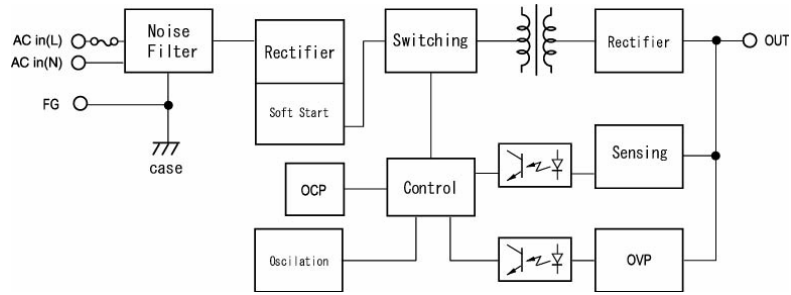
\*3 measured by a bayonet probe at the end of a pair of 20cm long wires terminated with a 47uF electrolytic capacitor and a 0.1uF film capacitor in parallel at a 0 to 100MHz bandwidth

\*4 at -5 to +50°Cenclosed type: at -5 to +40°C

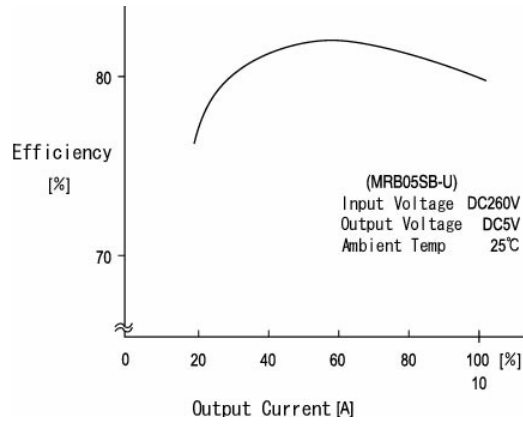
\*5 for 7hour period after 1hour warm-up at 25°Cand rated input/output

\*6 when output current changed from 25% to 75% of rated output current rapidly at AC230V input

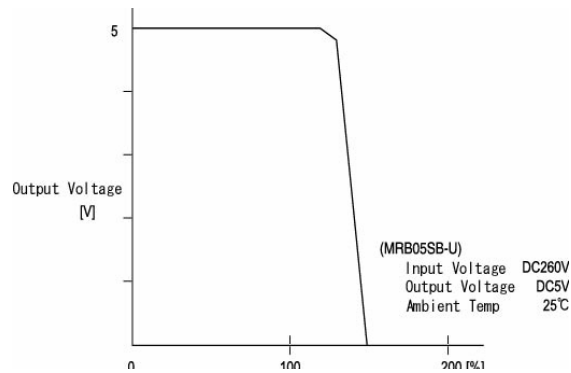
### Block Diagram



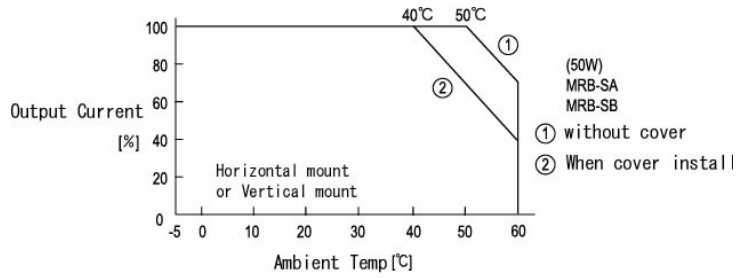
### Efficiency Curve



### OCP Curve



### Derating Curve



### Dimension (mm)

