



## SLBXX-10XXX SERIES

SLB--- are high efficiency green power modules with various packaging provided by Schmid-M. The features of this series are: wide input voltage, DC and AC all in one, high efficiency, high reliability, low loss, safety isolation etc. They are widely used in industrial, office and civil equipments. EMC and safety standards meet international standards IEC61000 UL60950 and IEC60950 and Multi-certificate is in processing



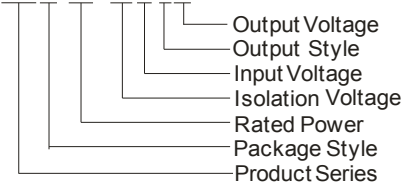
### PRODUCT FEATURES

1. Universal Input :100 ~ 240VAC,50/60Hz
2. AC and DC all in one (input from the same terminal)
3. Low Ripple and Noise
4. Overload protection and short circuit protection
5. Low loss, green power
6. Multiple models available
7. industrial level specifications



### MODEL SELECTION

SLB10-10B24



### PRODUCT PROGRAM

| Approval | Model             | Package        | Power      | Output (Vo1/Io1) | Output (Vo2/Io2) | Ripple and Noise(TYP.) | efficiency(%) (TYP.) |
|----------|-------------------|----------------|------------|------------------|------------------|------------------------|----------------------|
| UL/CE    | SLB03-10B03       | 48.5X36X20.5mm | 3W         | 3.3V/1000mA      |                  | 50mV                   | 68                   |
| UL/CE    | SLB03-10B05       |                |            | 5V/600mA         |                  |                        | 71                   |
| UL/CE    | SLB03-10B12       |                |            | 12V/250mA        |                  |                        | 74                   |
| UL/CE    | SLB03-10B15       |                |            | 15V/200mA        |                  |                        | 75                   |
| UL/CE    | SLB03-10B24       |                |            | 24V/125mA        |                  |                        | 77                   |
| UL/CE    | SLB05-10B03       | 55X45X21.0mm   | 5W         | 3.3V/1500mA      |                  | 50mV                   | 70                   |
| UL/CE    | SLB05-10B05       |                |            | 5V/1000mA        |                  |                        | 73                   |
| UL/CE    | SLB05-10B09       |                |            | 9V/600mA         |                  |                        | 75                   |
| UL/CE    | SLB05-10B12       |                |            | 12V/450mA        |                  |                        | 76                   |
| UL/CE    | SLB05-10B15       |                |            | 15V/350mA        |                  |                        | 78                   |
| UL/CE    | SLB05-10B24       |                |            | 24V/230mA        |                  |                        | 79                   |
| UL/CE    | SLB05-10A05       |                |            | +5V/500mA        | -5V/500mA        |                        | 70                   |
| UL/CE    | SLB05-10A12       |                |            | +12V/210mA       | -12V/210mA       |                        | 74                   |
| UL/CE    | SLB05-10A15       |                |            | +15V/170mA       | -15V/170mA       |                        | 75                   |
| UL/CE    | SLB05-10A24       |                |            | +24V/100mA       | -24V/100mA       |                        | 77                   |
| UL/CE    | SLB05-10D0505-01  |                |            | +5V/900mA        | +5V/100mA        |                        | 70                   |
| UL/CE    | SLB05-10D0512-01  |                |            | +5V/750mA        | +12V/100mA       |                        | 74                   |
| UL/CE    | SLB05-10D0515-01  |                |            | +5V/700mA        | +15V/100mA       |                        | 74                   |
| UL/CE    | SLB05-10D0524-01  |                |            | +5V/600mA        | +24V/100mA       |                        | 75                   |
|          | SLB10-10B03       |                |            | 62X45X22.5mm     | 10W              |                        | 3.3V/3000mA          |
|          | SLB10-10B05       | 5V/2000mA      |            |                  |                  | 73                     |                      |
|          | SLB10-10B09       | 9V/1100mA      |            |                  |                  | 77                     |                      |
|          | SLB10-10B12       | 12V/900mA      |            |                  |                  | 78                     |                      |
|          | SLB10-10B15       | 15V/700mA      |            |                  |                  | 78                     |                      |
|          | SLB10-10B24       | 24V/450mA      |            |                  |                  | 80                     |                      |
|          | SLB10-10A05       | +5V/1000mA     | -5V/1000mA |                  |                  | 73                     |                      |
|          | SLB10-10A12       | +12V/450mA     | -12V/450mA |                  |                  | 78                     |                      |
|          | SLB10-10A15       | +15V/350mA     | -15V/350mA |                  |                  | 79                     |                      |
|          | SLB10-10D0505-02I | 5V/2000mA      | 5V/200mA   |                  |                  | 72                     |                      |
| UL/CE    | SLB15-10B03       | 70X48X23.5mm   | 15W        |                  |                  | 3.3V/3500mA            |                      |
| UL/CE    | SLB15-10B05       |                |            | 5V/3000mA        |                  | 74                     |                      |
| UL/CE    | SLB15-10B12       |                |            | 12V/1250mA       |                  | 79                     |                      |
| UL/CE    | SLB15-10B15       |                |            | 15V/1000mA       |                  | 80                     |                      |
| UL/CE    | SLB15-10B24       |                |            | 24V/625mA        |                  | 81                     |                      |

## INPUT SPECIFICATIONS

|                                   |  |   |
|-----------------------------------|--|---|
| Input voltage range               |  | 85-264VAC , 120-370VDC  |
| Input frequency                   |  | 47- 63Hz  |
| Input current                     | SLB03 models<br>SLB05 models<br>SLB10 models<br>SLB15 models | 110VAC      230VAC<br>60mA , typ      30mA , typ<br>100mA , typ      60mA , typ<br>200mA , typ      100mA , typ<br>280mA , typ      150mA , typ |
| Inrush current                    | SLB03/05 models<br>SLB10/15 models                           | 110VAC      230VAC<br>10A, typ      20A, typ<br>10A, typ      30A, typ  |
| External input fuse (recommended) | SLB03/05 models<br>SLB10/15 models                           | 1A/250V      slow blow<br>2A/250V      slow blow  |

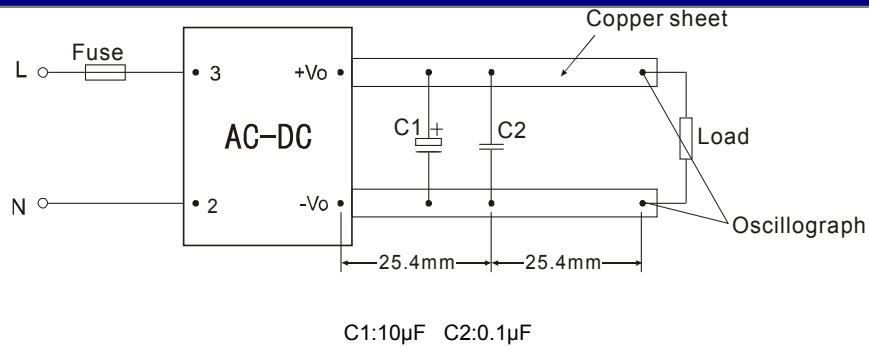
## OUTPUT SPECIFICATIONS

|   |   |  |
|---|---|--|
| Voltage set accuracy  |   | ±2%(main out)                                    |
| Input variation   |   | ±0.5%(main out) ±1.5%□others□                    |
| Load variation (10%-100%)<br>(symmetric load)<br>(symmetric load)<br>(symmetric load) | Single output models<br>Dual output models<br>Isolation & twin output (with voltage regulator)<br>Isolation & twin output (without voltage regulator) | ±1%<br>±2%<br>±2%<br>±3%(main out) ±5%□others□   |
| Minimum load  | Single output models<br>Dual output models<br>Isolation & twin output   | 0%<br>10% (main out)<br>10% (main out)           |
| Ripple& noise(p-p)  | (20MHz Bandwidth)   | ≤100mV   |
| Short circuit protection  |   | Continuous, and auto resume (except specialties) |
| Over current protection   |   | ≥110% I <sub>o</sub>                             |
| Over output voltage protection  | 3.3 / 5VDC models<br>9VDC models<br>12 / 15VDC models<br>24VDC models<br>48VDC models   | ≤6.5VDC<br>≤12VDC<br>≤20VDC<br>≤30VDC<br>≤60VDC  |

## COMMON SPECIFICATIONS

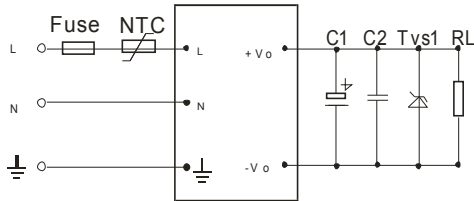
|                           |   |  |
|---------------------------|---|--|
| Temperature ranges        | Operating :<br>Power derating (above 55°C)<br>Storage:<br>Case temperature:                                       | -40°C to+70°C<br>3.75% / °C<br>-40°C to +105°C<br>+90°C max  |
| Hold-up time              |   | 80ms(typ.) at Vin:230VAC   |
| Humidity (non condensing) |   | 85% (max.)   |
| Temperature coefficient   |   | 0.02% /°C (main out) 0.15% /°C(others)   |
| Switching frequency       |   | 150kHz max.  |
| Efficiency                |   | 78% typ.   |
| I/O-isolation voltage     |   | 3000VAC/1Min   |
| Leakage current           |   | 0.3mA RMS typ. 230VAC/50Hz   |
| EMI/RFI conducted         |   | EN55022, level B   |
| EMC compliance            | Electrostatic discharge ESD<br>RF field susceptibility<br>Electrical fast transients/bursts on mainsline<br>Surge | IEC/EN 61000-4-2 level 3 6kV/8kV<br>IEC/EN 61000-4-3<br>IEC/EN 61000-4-4 level 3 2kV<br>IEC/EN 61000-4-5 level 3 1kV / 2kV |
| Safety standards          |   | IEC60950,EN60950,UL60950   |
| Safety approvals          |   | EN60950, IEC60950,UL60950  |
| Safety Class              |   | CLASS 1 (SLB10-10B : CLASS 2)  |
| Case material             |   | UL 94V-0   |
| Install                   |   | PCB  |
| MTBF                      |   | >200,000h @25°C  |

## PARALLEL LINES MEASURE

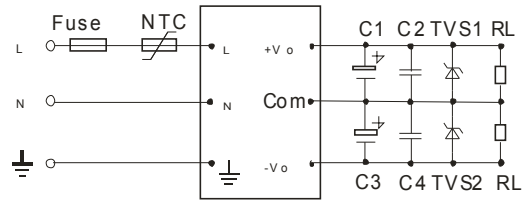


## TYPICAL APPLICATIONS

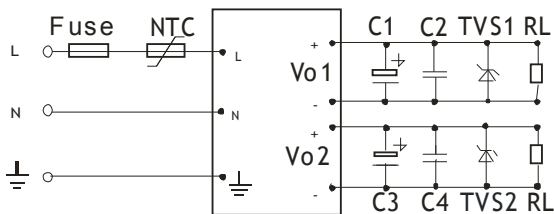
SLB\*\*-10B\*\*( single Output)



SLB\*\*-10A\*\*(Dual output)



SLB\*\*-10D\*\*(Isolate Twin Output)



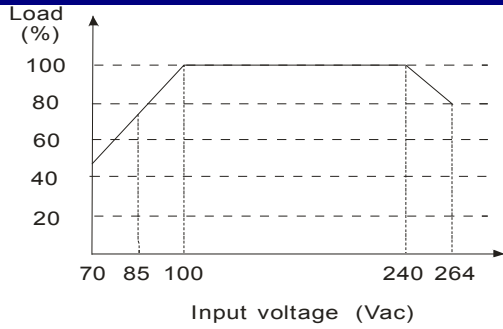
### EXTERNAL TYPICAL VALUE

| MODEL            | C1(µF) | C3(µF) | MODEL             | C1(µF) | C3(µF) |
|------------------|--------|--------|-------------------|--------|--------|
| SLB03-10B03      | 220    |        | SLB10-10B03       | 470    |        |
| SLB03-10B05      | 220    |        | SLB10-10B05       | 330    |        |
| SLB03-10B12      | 120    |        | SLB10-10B09       | 120    |        |
| SLB03-10B15      | 68     |        | SLB10-10B12       | 120    |        |
| SLB03-10B24      | 10     |        | SLB10-10B15       | 120    |        |
| SLB05-10B03      | 330    |        | SLB10-10B24       | 68     |        |
| SLB05-10B05      | 330    |        | SLB10-10A05       | 220    | 220    |
| SLB05-10B09      | 120    |        | SLB10-10A12       | 120    | 120    |
| SLB05-10B12      | 120    |        | SLB10-10A15       | 47     | 47     |
| SLB05-10B15      | 68     |        | SLB10-10D0505-02I | 220    | 120    |
| SLB05-10B24      | 68     |        | SLB15-10B03       | 330    |        |
| SLB05-10A05      | 120    | 120    | SLB15-10B05       | 680    |        |
| SLB05-10A12      | 68     | 68     | SLB15-10B12       | 220    |        |
| SLB05-10A15      | 47     | 47     | SLB15-10B15       | 220    |        |
| SLB05-10A24      | 10     | 10     | SLB15-10B24       | 68     |        |
| SLB05-10D0505-01 | 220    | 68     |                   |        |        |
| SLB05-10D0512-01 | 220    | 68     |                   |        |        |
| SLB05-10D0515-01 | 220    | 47     |                   |        |        |
| SLB05-10D0524-01 | 220    | 47     |                   |        |        |

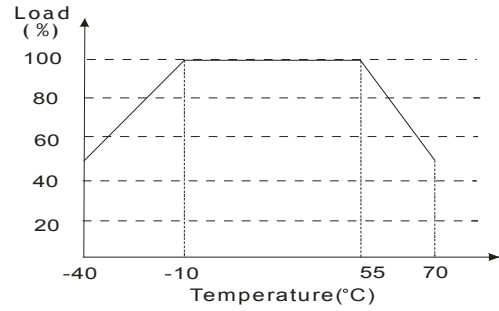
**Remarks**

- Output filtering capacitor C3 and C1 are electrolytic capacitor. It is recommended to use high frequency and low resistance electrolytic capacitor. For capacitance and current of the capacitor please refer to suppliers' specifications. Voltage derating of capacitor should be 80% or above. C2, C4 and C6 eliminate high frequency noise. TVS is a recommended component to protect post-circuits (when converter fails).
- External input NTC is recommended to use 5D-9 ( Only SLB10 models)

## INPUT VOLTAGE VS LOAD



## TEMPERATURE VS LOAD

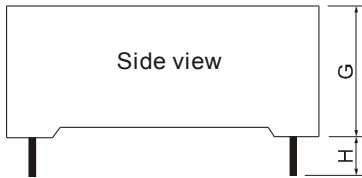
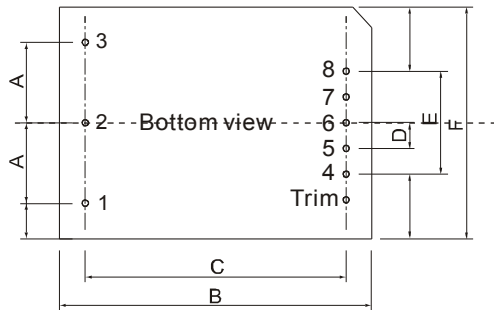


The relationship of dc and ac is as follows while input voltage is dc:

$$V_{dc} = 1.414V_{ac} - 20V_{dc}$$

## OUTLINE DIMENSIONS & FOOTPRINT DETAILS

First Angle Projection



Note:  
 Unit: mm  
 Pin section: 1.00mm  
 Pin length(H):  $\geq 6.00$ mm  
 Pin tolerances:  $\pm 0.1$ mm  
 General tolerances:  $\pm 0.5$ mm

### Outline and Dimensions

| NO. | SLB03 | SLB05 | SLB10 | SLB15 |
|-----|-------|-------|-------|-------|
| A   | 12.5  | 17.5  | 17.5  | 20.0  |
| B   | 48.5  | 55.0  | 62.0  | 70.0  |
| C   | 40.5  | 47.0  | 54.0  | 62.0  |
| D   | 4.0   | 5.0   | 5.0   | 5.75  |
| E   | 16.0  | 20.0  | 20.0  | 23.0  |
| F   | 36.0  | 45.0  | 45.0  | 48.0  |
| G   | 20.5  | 21.0  | 22.5  | 23.5  |
| H   | 6.0   | 6.0   | 6.0   | 6.0   |

### FOOTPRINT DETAILS

| Pin  | SLB**-10B | SLB**-10A | SLB**-10C | SLB**-10D |
|------|-----------|-----------|-----------|-----------|
| 1    | $\neq^*$  | $\neq$    | $\neq$    | $\neq$    |
| 2    | AC(N)     | AC(N)     | AC(N)     | AC(N)     |
| 3    | AC(L)     | AC(L)     | AC(L)     | AC(L)     |
| 4    | -Vo       | -Vo       | -Vo1      | -Vo1      |
| 5    | No Pin    | No Pin    | +Vo1      | +Vo1      |
| 6    | No Pin    | COM       | -Vo2      | No Pin    |
| 7    | No Pin    | No Pin    | COM       | -Vo2      |
| 8    | +Vo       | +Vo       | +Vo2      | +Vo2      |
| Trim | Trim*     | No Pin    | No Pin    | No Pin    |

$\neq^*$ : There is no  $\neq$  on SLB10-10BXX.

Trim\*: Only For SLB15-10BXXSeries

### MODLES WEIGHT

| WEIGHT (TYP.) | SLB03 | SLB05 | SLB10 | SLB15 |
|---------------|-------|-------|-------|-------|
|               | 50g   | 70g   | 80g   | 120g  |