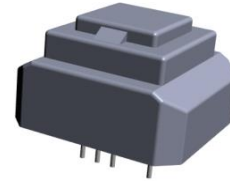


Power Modules (Power Supplies with Ultra-low Standby Power Consumption)

■Features

- 1.Easy to design compact AC/DC due to small number of external components
- 2.Enables significant reduction in power consumption of no-load and light load
- 3.Corresponding world wide input and PFC output voltage (Vin:DC110V~450V)
- 4.Unique Tamura design insures significant reduction in 'buzz'
under light-load conditions for lower noise level
- 5.Reinforced insulation



■Applications

- Industrial equipment
- Information processing equipment
- AV equipment
- Home electric appliances
- Other standby power supplies and compact power supplies

■Certified safety standards

UL 60950-1, CSA C22.2 No.60950-1 (E132244)
IEC60950-1(CB), IEC60065(CB)



Certified input voltage range

…DC110-340V

■Applicable safety standards

UL/CSA/IEC/EN60950-1
UL/CSA/IEC/EN60065
IEC/EN60335-1

Applicable input voltage range

…DC110-340V
…DC110-340V
…DC110-450V

■Application circuit

Method to select external parts for input rectification and smoothing as well as output smoothing is supported by the application note.

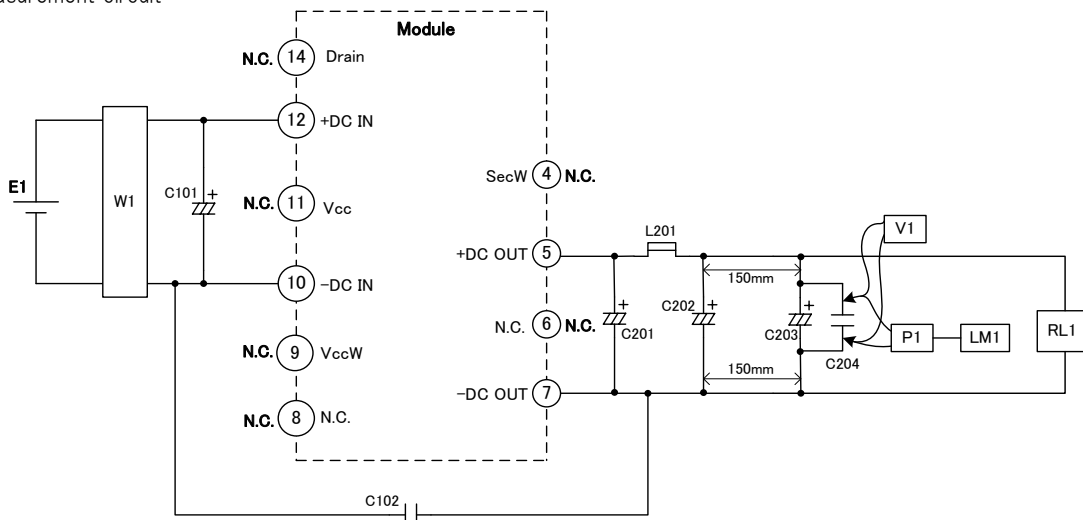
Input-output condition

| Item | Specification | Conditions·Note |
|----------------------------------|----------------------------|--|
| Input voltage range | DC110~450V (DC50V~450V) | Average voltage (Refer to the Input voltage derating curve) |
| Maximum input voltage | 450V or less | Including peak value |
| Input ripple voltage lower limit | 80V or more | Ripple voltage of the AC input rectified |
| Rated input voltage | DC140V, DC340V | |
| Rated output voltage | 12V | |
| Rated load current | 0.5A | |

Electrical specification Ta=25°C

| Item | Specification | Conditions·Note |
|--------------------------|------------------|---|
| Efficiency | 75% or more | Rated input voltage Rated output current |
| Output voltage tolerance | ±5% | |
| Line regulation | 50mV or less | Input voltage DC110V~450V |
| Load regulation | 200mV or less | Output current 0~500mA |
| No-load power | 70mW or less | Rated input voltage |
| Ripple | 120mVp-p or less | Rated input voltage Rated output current |
| Ripple noise | 150mVp-p or less | |

Measurement circuit



E1 : DC power supply
 W1 : Power meter WT210 (YOKOGAWA)
 RL1: Electronic load
 V1 : Voltmeter Class 0.5
 P1 : Differential probe DP-100(KG)
 LM1: Ripple noise meter RM-103(KG)

C101 : 450BXC22M (RUBYCON)
 C102 : CD65ZU2GA681M (TDK)
 C201 : 25ZLG220M (RUBYCON)
 C202 : 25ZLG220M (RUBYCON)
 C203 : 25ZLG47M (RUBYCON)
 C204 : 50F2D104K (RUBYCON)
 L201 : PJ5H-2R2M (KORIN)

Protection

| Item | Specification | Conditions·Note |
|------------------------|---------------|-----------------|
| Overcurrent protection | 0.53A or more | Hiccup mode |
| Overvoltage protection | 13.5~18V | Latch off |
| Overheat protection | | Latch off |

Insulation

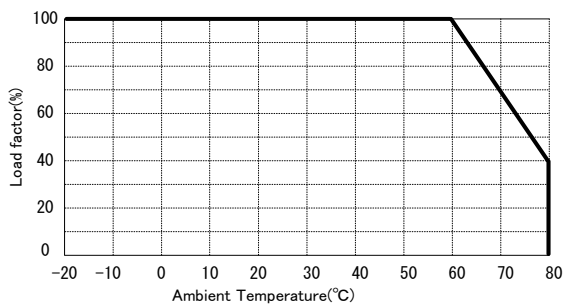
| Item | Specification | Conditions·Note |
|---|---------------|-----------------|
| Dielectric withstand voltage (Between Pri—Sec) | AC3.75kV 1min | Cutoff 2mA |
| Insulation resistance (Between Pri—Sec) | 100MΩ or more | DC500V |

Environmental conditions

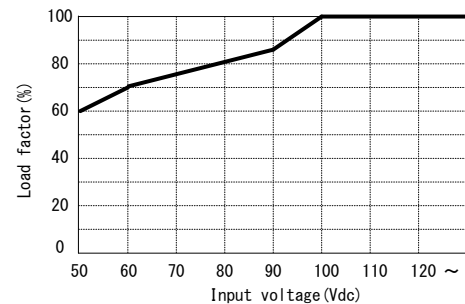
| Item | Specification | Conditions·Note |
|-----------------------|-------------------------------|---|
| Operation temperature | -20°C~80°C | Refer to the Ambient temperature derating curve |
| Operating humidity | 20~95%RH (No condensation) | |
| Storage temperature | -25°C~85°C | |
| Storage humidit | 5~95%RH (No condensation) | |

Ambient temperature derating curve

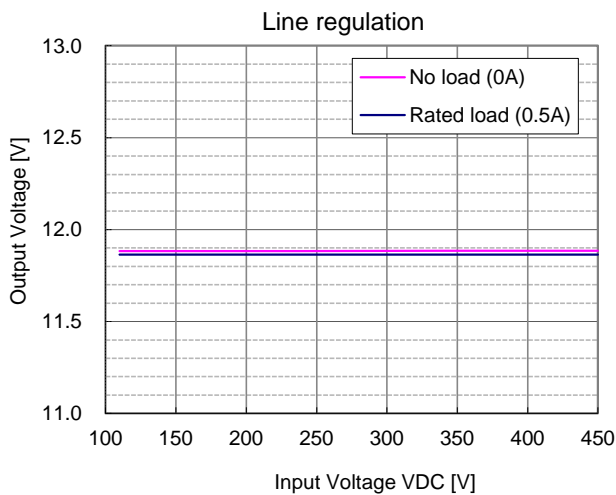
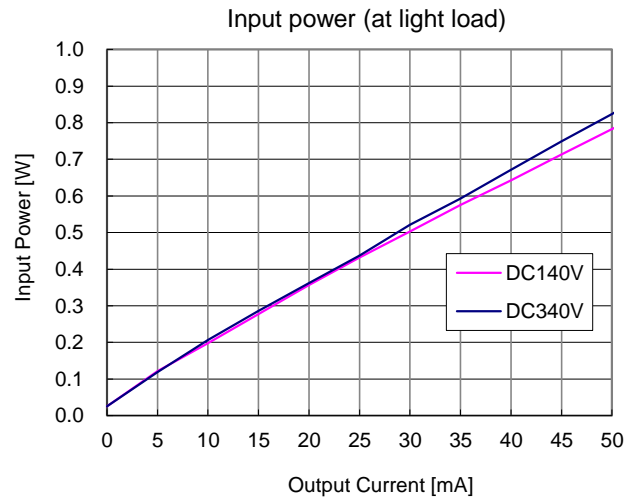
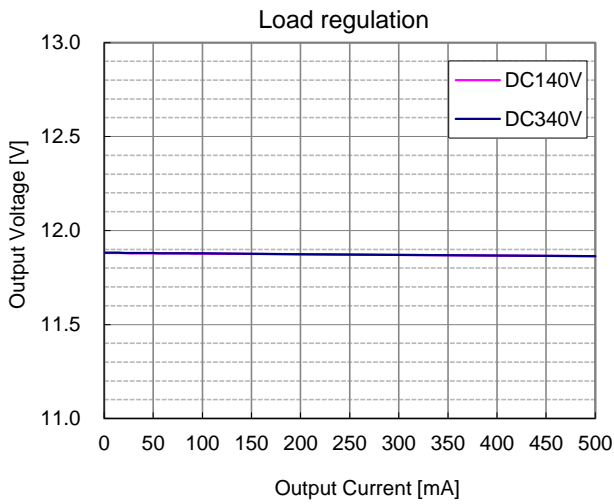
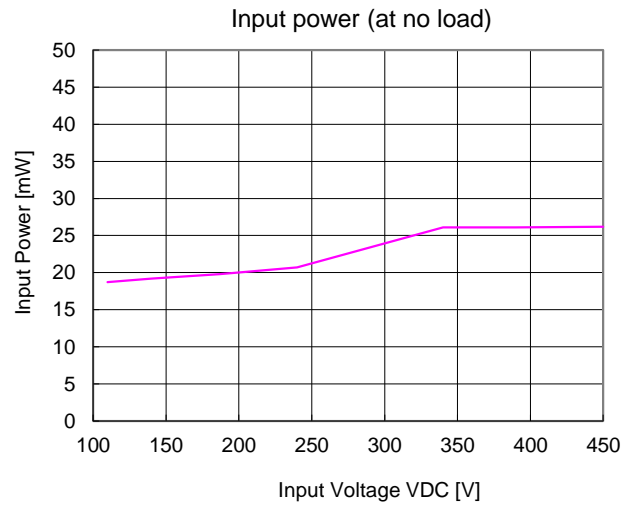
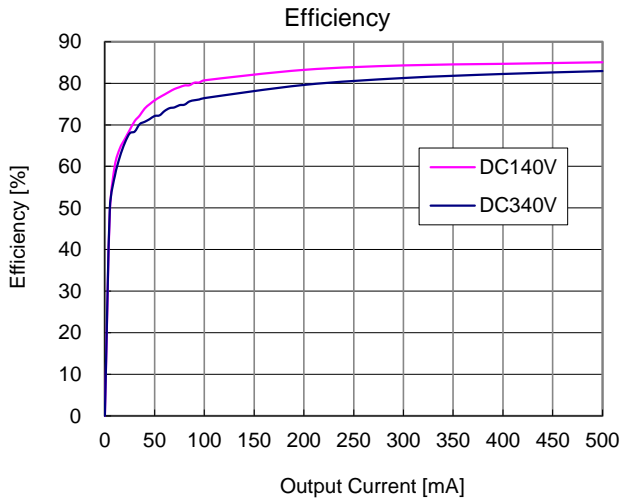
Reduce the load current according to the following temperature derating table.


Input voltage derating curve

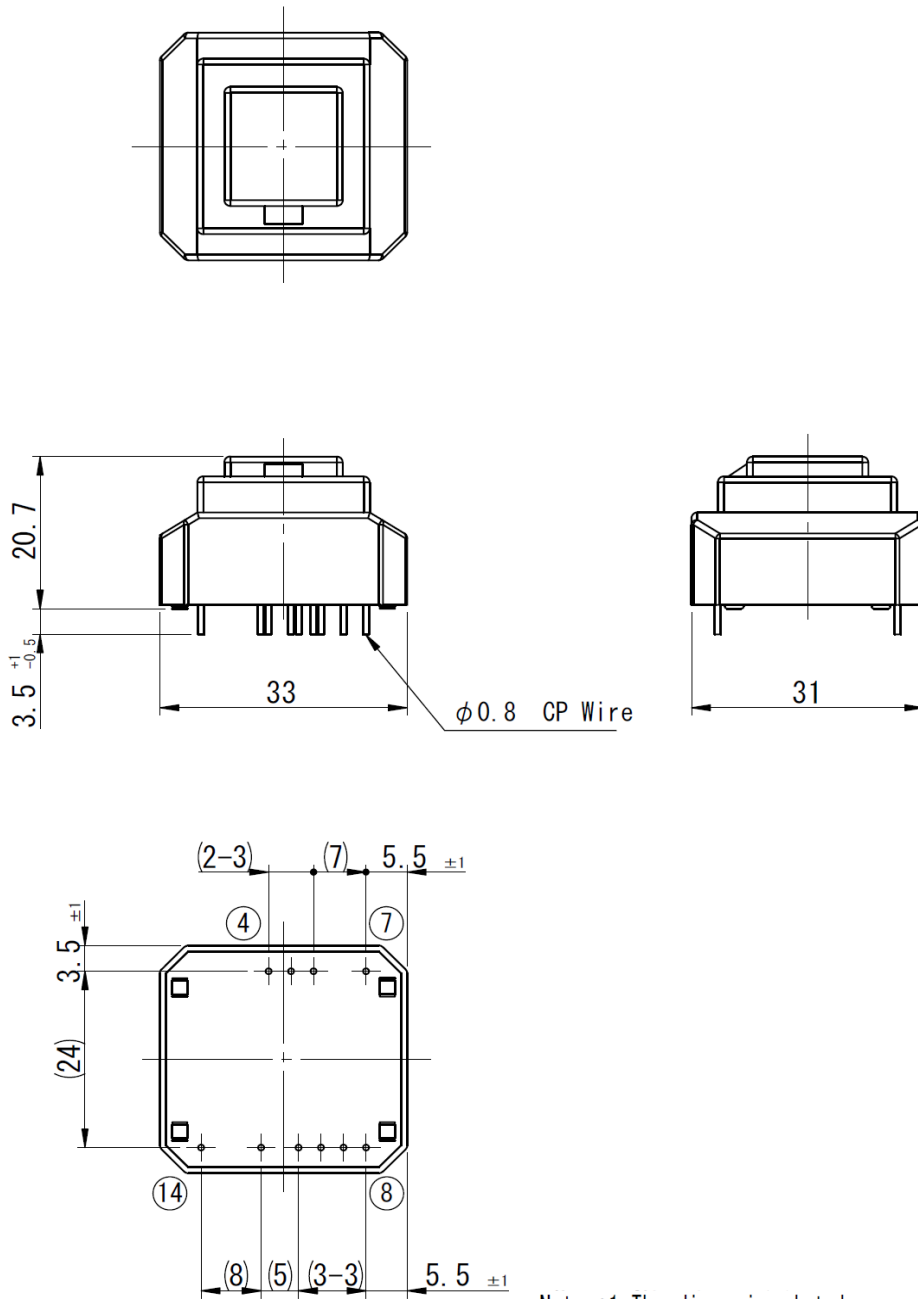
Reduce the load current according to the following input voltage derating table.



■ Typical characteristics Ta=25°C

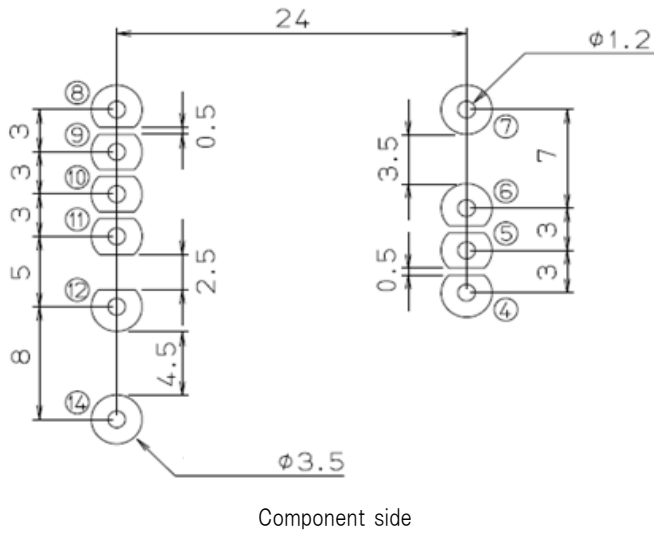


■ Outline dimensional drawing



Note :1.The dimensional tolerance without directions is ± 0.5 mm.

Unit:mm

Recommended hole diameter and land size


※ The round pulling out figure is a pin numbering.

Unit:mm

Terminal function and connection

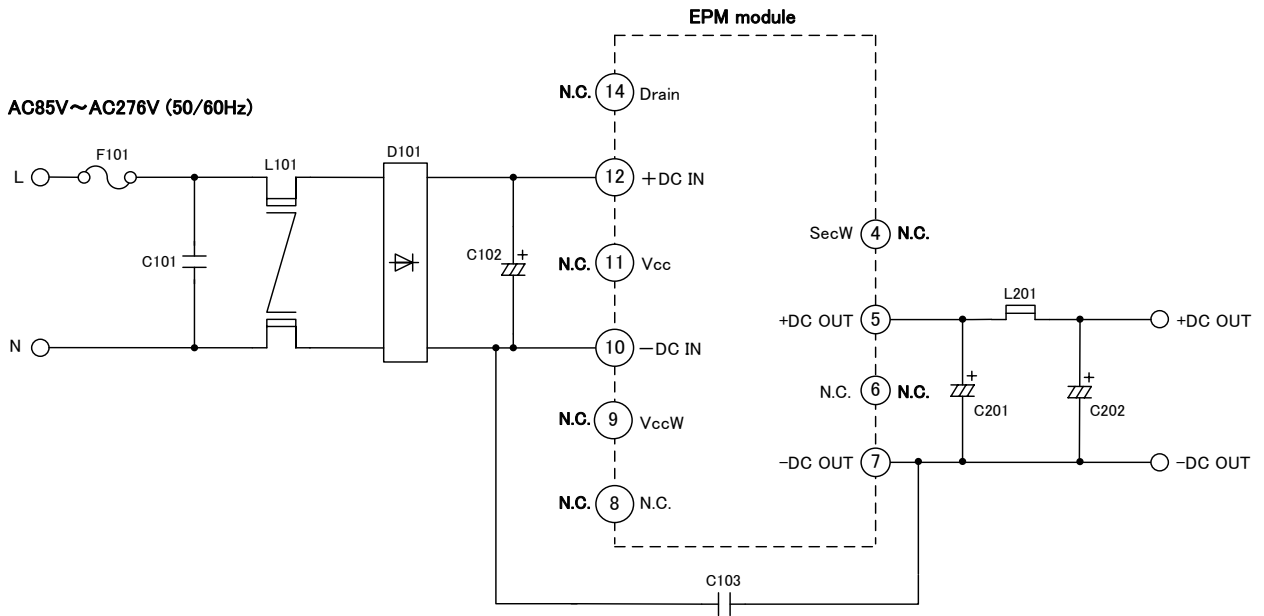
Secondaries

| Pin No. | Name | Explanation of terminals |
|---------|---------|--|
| 1 | | No terminal |
| 2 | | No terminal |
| 3 | | No terminal |
| 4 | SecW | Non-contact terminal ※Don't connect with other circuits. |
| 5 | +DC OUT | Output terminal (+) |
| 6 | N.C. | Non-contact terminal ※Don't connect with other circuits. |
| 7 | -DC OUT | Output terminal (-) |

Primaries

| Pin No. | Name | Explanation of terminals |
|---------|--------|--|
| 8 | N.C. | Non-contact terminal ※Don't connect with other circuits. |
| 9 | VccW | Non-contact terminal ※Don't connect with other circuits. |
| 10 | -DC IN | DC voltage input terminal (-) |
| 11 | Vcc | Terminal for start-up time adjustment |
| 12 | +DC IN | DC voltage input terminal (+) |
| 13 | | No terminal |
| 14 | Drain | Terminal for noise adjustment |

■ Application circuit example



| Symbol | Description | Part No. | Manufacturer |
|--------|-------------|---------------|---------------|
| D101 | Diode | D2SB60 | SHINDENGEN |
| L101 | Inductor | LF-4Z-E333 | KORIN |
| L201 | Inductor | PJ5H-2R2M | KORIN |
| C101 | Capacitor | LE104-MX | OKAYA |
| C102 | Capacitor | 450BXC22M | RUBYCON |
| C103 | Capacitor | CD65ZU2GA681M | TDK |
| C201 | Capacitor | 25ZLG220M | RUBYCON |
| C202 | Capacitor | 25ZLG220M | RUBYCON |
| F101 | Fuse | FIH 250V 1.6A | NIPPON-SEISEN |

※Mount the fuse on the input Live side to ensure safety without fail.

Recommended parts:FIH 250V 1.6A~2.5A/NIPPON-SEISEN

※Depend on the applying safety standard, please add the discharge resistance in paralell with C101.

■ Usage cautions

- Always mount fuse on the Live side of input for ensuring safety because the fuse is not built-in the product. Please select the fuse considering conditions such as steady current, inrush current, and ambient temperature at your own responsibility
 ※Recommended parts: FIH 250V 1.6A~2.5A / NIPPON-SEISEN
 When using a fuse having large rated current or high capacity input electrolytic condenser, by combining another converter and input line and input electrolytic condenser, fuse may not blow off in the case of abnormality.
 Do not combine high voltage line and fuse.

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 - Use in locations where corrosive gases such as salt air, C12, H2S, NH3, SO2, or NO2, are present.
 - Use in environments with strong static electricity or electromagnetic radiation.
 - Use that involves placing inflammable material next to the product.
 - Use of this product either sealed with a resin filling or coated with resin.
 - Use of water or a water soluble detergent for flux cleaning.
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