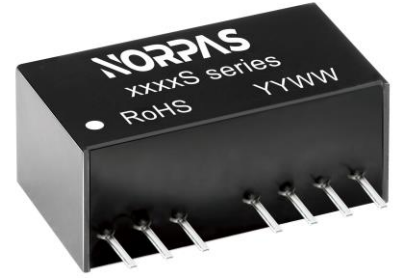


FEATURES

1. Package Type: SIP8
2. Operating temperature range: -40°C - +85°C
3. Isolation voltage: 1600VDC
4. 4:1 Ultra-wide input voltage range
5. High efficiency up to 87%
6. The mechanism has input undervoltage protection, output short circuit protection and over current protection
7. Fields of application: Power, industrial control, communications, Internet of Things, automotive, etc



3 years
Warranty

Selection Guide

| Part No. | Input Voltage (VDC) | | Output | | | Full Load Efficiency% (Min./Typ.) | Capacitive Load(μF) Max. |
|---------------|---------------------|---------|---------------|------------------|------------------|-----------------------------------|--------------------------|
| | Nominal (Range) | Maximum | Voltage (VDC) | Current Min.(mA) | Current Max.(mA) | | |
| ZYB2403S-6WR3 | 24 (9-36) | 40 | 3.3 | 0 | 1350 | 78 | 1800 |
| ZYB2405S-6WR3 | | | 5 | 0 | 1200 | 82 | 1000 |
| ZYB2406S-6WR3 | | | 6 | 0 | 1000 | 82 | 680 |
| ZYB2409S-6WR3 | | | 9 | 0 | 667 | 84 | 470 |
| ZYB2412S-6WR3 | | | 12 | 0 | 500 | 86 | 470 |
| ZYB2415S-6WR3 | | | 15 | 0 | 400 | 87 | 220 |
| ZYB2424S-6WR3 | | | 24 | 0 | 250 | 85 | 100 |
| ZYA2405S-6WR3 | | | ±5 | 0 | 600 | 80 | 470# |
| ZYA2409S-6WR3 | | | ±9 | 0 | 333 | 83 | 220# |
| ZYA2412S-6WR3 | | | ±12 | 0 | 250 | 83 | 120# |
| ZYA2415S-6WR3 | | | ±15 | 0 | 200 | 83 | 100# |
| ZYA2424S-6WR3 | | | ±24 | 0 | 125 | 82 | 68# |
| ZYB4812S-6WR3 | | | 48 (18-75) | 80 | 12 | 0 | 500 |
| ZYB4815S-6WR3 | 15 | 0 | | | 400 | 84 | 150 |
| ZYB4824S-6WR3 | 24 | 0 | | | 250 | 82 | 68 |
| ZYA4815S-6WR3 | ±15 | 0 | | | 200 | 83 | 100# |

each output

Input Specifications

| Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|--------------------------------------|---------------------------|---------------|---------------------------|--------|--------|------|
| Input Current (full load/no-load) | 24V input | 3.3VDC output | -- | 238/5 | 248/12 | mA |
| | | Other | -- | 305/5 | 315/12 | |
| | 48V input | 5VDC output | -- | 156/5 | 166/12 | |
| | | Other | -- | 146/10 | 156/16 | |
| Reflected Ripple Current | | | -- | 50 | -- | |
| Impulse Voltage | 24VDCnominal input series | | -0.7 | -- | 50 | VDC |
| | 48VDCnominal input series | | -0.7 | -- | 100 | |
| Starting Voltage | 24VDCnominal input series | | -- | -- | 9 | |
| | 48VDCnominal input series | | -- | -- | 18 | |
| Input undervoltage protection | 24VDCnominal input series | | 5.5 | 6.5 | -- | |
| | 48VDCnominal input series | | 12 | 15.5 | -- | |
| Input Filter | | | Capacitance Filter | | | |
| Hot Plug | | | Unavailable | | | |
| CTRL | turn on module | | connected GND or (0-1.2V) | | | |
| | turn off module | | No connected or (3.5-12V) | | | |

Output Specifications

| Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|-------------------------------|--|----------------------|---------------------------|------|-------|-------|
| Output Voltage Accuracy | 5%-100% load | | -- | ±1.0 | ±3.0 | % |
| Linear Regulation Rate | full load,input voltage from the lower limit to the higher limit | | -- | ±0.5 | ±1 | |
| Load Regulation Rate | 5%-100% load | | -- | ±0.5 | ±1.5 | |
| Instantaneous Recovery | 25% step change of load,nominal input voltage | | -- | 0.3 | 0.5 | ms |
| Transient Response Deviation | 25% step change of load,nominal input | 3.3 、 5VDC output | -- | ±5 | ±8 | % |
| | | Other voltage output | -- | ±3 | ±5 | |
| Temperature Drift Coefficient | Full load | | -- | -- | ±0.03 | %/°C |
| Ripple & Noise | 20MHz bandwidth,5%-100% load | | -- | 50 | 100 | mVp-p |
| Over Current Protection | input voltage range | | 110 | 160 | 230 | %Io |
| Short-Circuit Protection | | | Continuous, Self-Recovery | | | |

General Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|---|---|---------|-------|------|------|
| Isolation Voltage | Input-output, test time 1 minute, leakage current less than 1mA | 1600 | -- | -- | VDC |
| Insulation Resistance | Input-output, insulated voltage 500VDC | 1000 | -- | -- | MΩ |
| Isolation Capacitance | Input-output, 100KHz/0.1V | -- | 1000 | -- | pF |
| Operating Temperature | See Figure 1 | -40 | -- | 105 | °C |
| Storage Temperature | | -55 | -- | 125 | |
| Storage Humidity | Non-condensing | 5 | -- | 95 | %RH |
| Pin welding can withstand the highest temperature | Soldering spot is 1.5mm away from case for 10 seconds | -- | -- | 300 | °C |
| Switching Frequency | Full load, nominal input voltage | 250 | 312.5 | 400 | kHz |
| MTBF | MIL-HDBK-217F@25°C | >1000Kh | | | |

Mechanical Specifications

| | |
|---------------------------|---|
| Case Material | Black plastic; flame-retardant and heat-resistant (UL94V-0 rated) |
| Package Dimensions | 22.0 x 9.5 x 12.0mm |
| Weight | 4.9g |
| Cooling Method | Free air convection |

EMC Specifications

| | | | |
|------------|-------|---|-----------------|
| EMI | CE | CISPR32/EN55032 CLASS B (The recommended circuit is shown in Figure 3-②) | |
| | RE | CISPR32/EN55032 CLASS B (The recommended circuit is shown in Figure 3-②) | |
| EMS | ESD | IEC/EN61000-4-2 Contact±4KV | Perf.Criteria B |
| | RS | IEC/EN61000-4-3 10V/m | Perf.Criteria A |
| | EFT | IEC/EN61000-4-4 ±2KV (The recommended circuit is shown in Figure3-③) | Perf.Criteria B |
| | Surge | IEC/EN61000-4-5 line to line ±1KV (The recommended circuit is shown in Figure 3-①) | Perf.Criteria B |
| | CS | IEC/EN61000-4-6 3Vr.m.s | Perf.Criteria A |

Typical Characteristic Curves

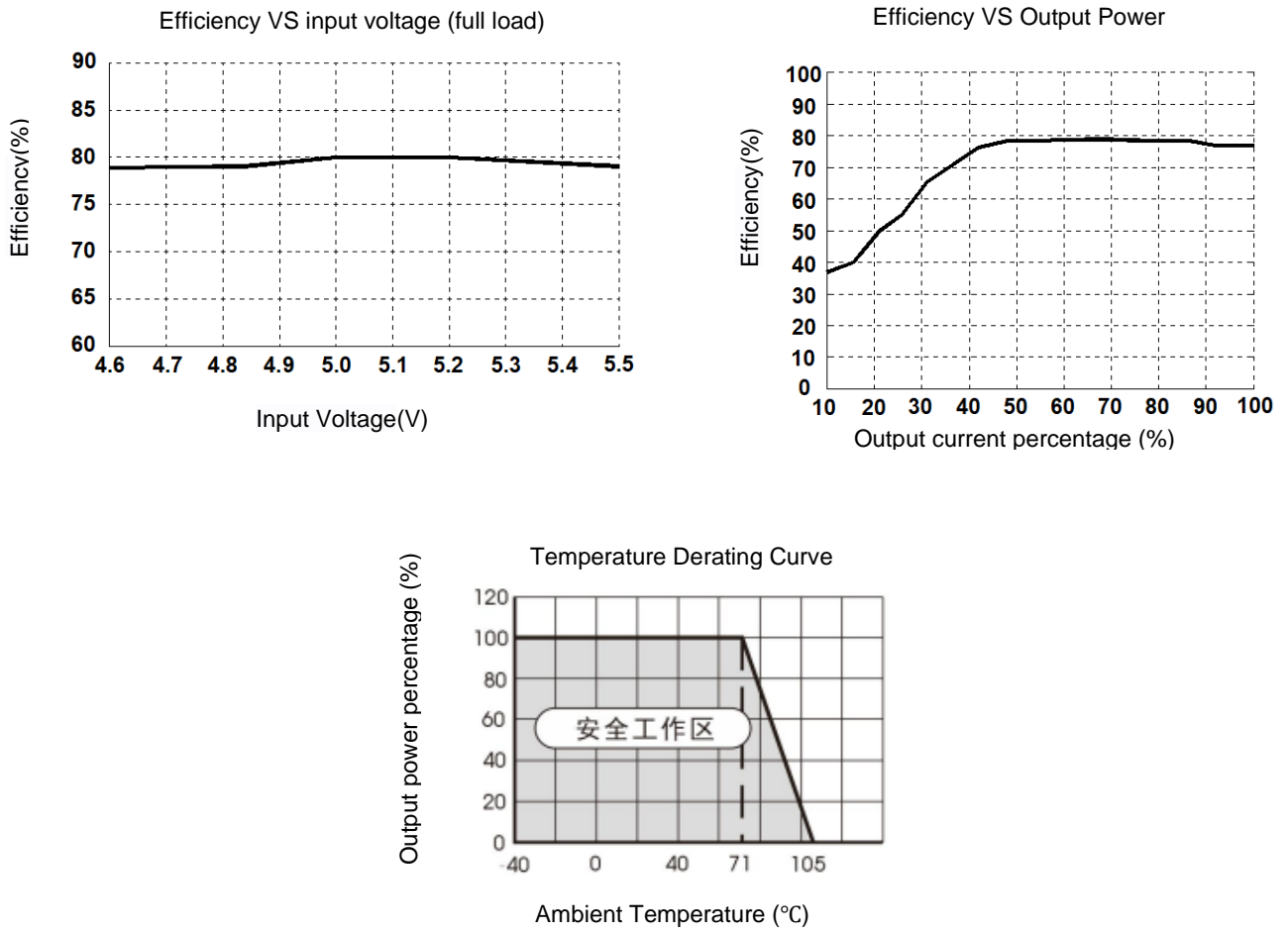


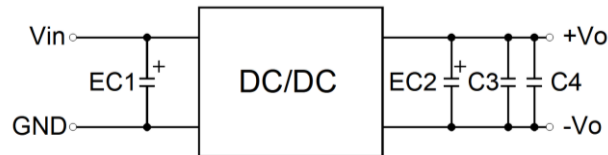
Figure 1

Typical Circuit Design And Application

Application circuit

All DC/DC converters of this series are tested in accordance with the test circuit recommended in FIG. 2 before delivery. If the input and output ripple is required to be further reduced, the input and output external capacitors C_{in} and C_{out} can be increased or a capacitor with a small series equivalent impedance value can be selected, but the capacitance value cannot be greater than the maximum capacitive load of the product.

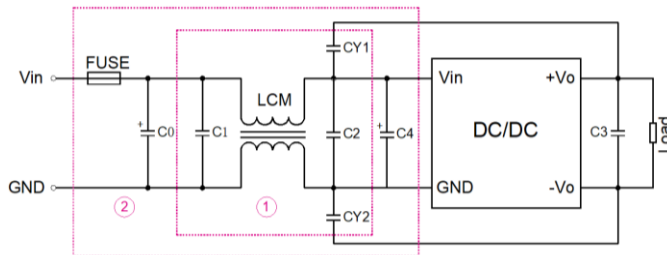
Figure 2



| Vout(VDC) | EC1(uF) | EC2(uF) | C3(uF) | C4(uF) |
|-----------|-----------|-----------|----------|-----------|
| 5 | 100μF/50V | 100uF/16V | 10uF/50V | 0.1uF/16V |
| 12/15 | | 47μF/25V | 10μF/50V | 0.1μF/25V |
| 24 | | 47μF/50V | 10μF/50V | 0.1μF/50V |

EMC Solutions - Recommended Circuits

Figure 3

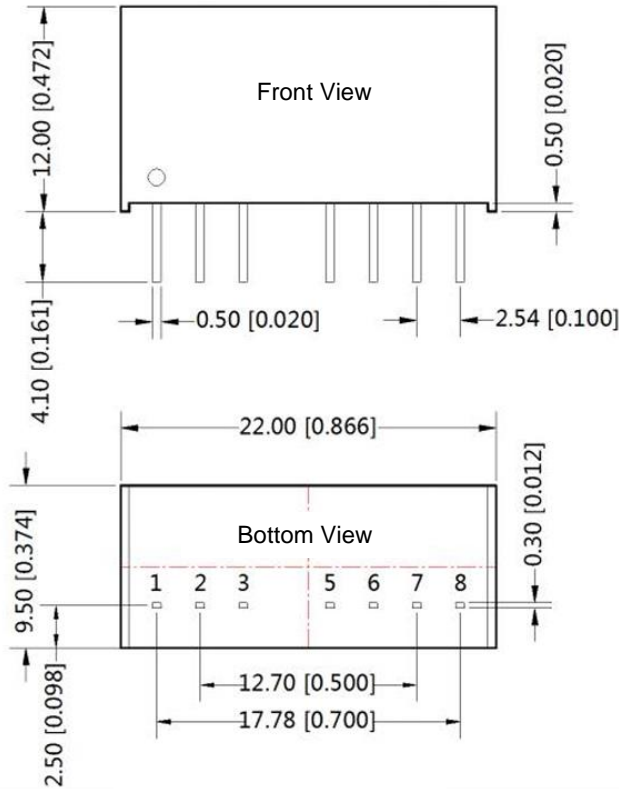


| Model | Vin:24V |
|---------|-------------------------|
| FUSE | Select according to the |
| C0、C4 | 330uF/50V |
| C1、C2 | 10μF/50V |
| LCM | 1.4-1.7mH |
| C3 | 22μF/50V |
| CY1、CY2 | 1nF/400VAC |

Note: Part ① in Figure 3 is for EMS test; Part ② in Figure 3 is used for EMI filtering, which can be selected according to the demand.

Dimensions and Recommended Layout

Dimensions



Note:

Unit: mm[inch]

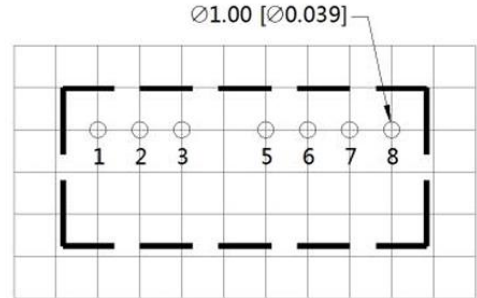
Pin section tolerances: $\pm 0.10[\pm 0.004]$

General tolerances: $\pm 0.50[\pm 0.020]$

Note:

1. If the product works under the minimum required load, it cannot guarantee that the performance of the product complies with all the performance indicators in this manual;
2. The maximum capacitive load is tested under the input voltage range and full load condition;
3. Unless otherwise stated, all indexes in this manual are measured at $T_a=25^\circ\text{C}$, humidity $<75\%RH$, nominal input voltage and rated output load;
4. All index testing methods in this manual are based on the enterprise standards of the company;
5. Our company can provide product customization, specific needs can directly contact our technical staff;

PCB Printing Layout & Pin Definition Table



Note: The grid distance is 2.54mm*2.54mm

| Pin | Function (single) | Function (double) |
|-----|-------------------|-------------------|
| 1 | GND | GND |
| 2 | Vin | Vin |
| 3 | CTRL | CTRL |
| 5 | NC | NC |
| 6 | +Vo | +Vo |
| 7 | 0V | 0V |
| 8 | CS | -Vo |

NC: Cannot be connected to any electrical connection

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Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.norpas-power.com

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