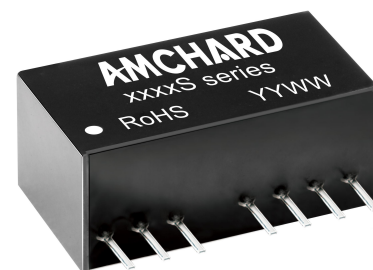


## Product Feature

1. Compact SIP8 Package
2. Operating Temperature Range: -40°C - +105°C
3. I/O Isolation Test Voltage 1.6KVDC
4. Wide 2:1 Input Voltage Range
5. High efficiency up to 87%
6. With the input undervoltage protection,output short-circuit protection and overcurrent protection mechanism
7. Fields of application: electric power, industrial control, communication, Internet of Things, automobile, rail transit, etc



3 years  
Warranty

## Selection Guide

| Part No.      | Input Voltage(VDC) |         | Output        |                       | Full Load Efficiency% (Typ.) | Capacitive Load Max. (μF) |
|---------------|--------------------|---------|---------------|-----------------------|------------------------------|---------------------------|
|               | Nominal (Range)    | Maximum | Voltage (VDC) | Current(mA) Max./Min. |                              |                           |
| GTB0505S-6WR3 | 5<br>(4.5-9)       | 12      | 5             | 1200/0                | 80                           | 1000                      |
| GTB0512S-6WR3 |                    |         | 12            | 500/0                 | 84                           | 470                       |
| GTB0515S-6WR3 |                    |         | 15            | 400/0                 | 84                           | 220                       |
| GTB0524S-6WR3 |                    |         | 24            | 250/0                 | 84                           | 100                       |
| GTA0505S-6WR3 |                    |         | ±5            | ±500/0                | 80                           | #500                      |
| GTA0512S-6WR3 |                    |         | ±12           | ±208/0                | 84                           | #220                      |
| GTA0515S-6WR3 |                    |         | ±15           | ±167/0                | 84                           | #100                      |
| GTA0524S-6WR3 |                    |         | ±24           | ±104/0                | 84                           | #50                       |
| GTB1203S-6WR3 | 12<br>(9-18)       | 20      | 3.3           | 1350/0                | 76                           | 1800                      |
| GTB1205S-6WR3 |                    |         | 5             | 1200/0                | 80                           | 1000                      |
| GTB1209S-6WR3 |                    |         | 9             | 667/0                 | 82                           | 470                       |
| GTB1212S-6WR3 |                    |         | 12            | 500/0                 | 84                           | 470                       |
| GTB1215S-6WR3 |                    |         | 15            | 400/0                 | 84                           | 220                       |
| GTB1224S-6WR3 |                    |         | 24            | 250/0                 | 84                           | 100                       |
| GTB2403S-6WR3 | 24<br>(18-36)      | 40      | 3.3           | 1350/0                | 78                           | 1800                      |
| GTB2405S-6WR3 |                    |         | 5             | 1200/0                | 82                           | 1000                      |
| GTB2409S-6WR3 |                    |         | 9             | 667/0                 | 84                           | 470                       |
| GTB2412S-6WR3 |                    |         | 12            | 500/0                 | 86                           | 470                       |
| GTB2415S-6WR3 |                    |         | 15            | 400/0                 | 87                           | 220                       |
| GTB2424S-6WR3 |                    |         | 24            | 250/0                 | 85                           | 100                       |
| GTB4805S-6WR3 | 48<br>(36-75)      | 80      | 5             | 1200/0                | 81                           | 1000                      |
| GTB4809S-6WR3 |                    |         | 9             | 667/0                 | 83                           | 470                       |
| GTB4812S-6WR3 |                    |         | 12            | 500/0                 | 85                           | 470                       |
| GTB4815S-6WR3 |                    |         | 15            | 400/0                 | 86                           | 330                       |
| GTB4824S-6WR3 |                    |         | 24            | 250/0                 | 84                           | 100                       |

# each output

## Input Specifications

| Item                                 | Operating Conditions                                 |               | Min.                     | Typ.    | Max.    | Unit |  |
|--------------------------------------|------------------------------------------------------|---------------|--------------------------|---------|---------|------|--|
| Input Current<br>(full load/no load) | 5VDC nominal input series,nominal input voltage      |               | --                       | 1538/28 | 1579/45 | mA   |  |
|                                      | 12VDC nominal input series,<br>nominal input voltage | 3.3VDC Output | --                       | 489/12  | 502/18  |      |  |
|                                      |                                                      | Other Output  | --                       | 625/12  | 641/18  |      |  |
|                                      | 24VDC nominal input series,<br>nominal input voltage | 3.3VDC Output | --                       | 238/5   | 245/12  |      |  |
|                                      |                                                      | 5VDC Output   | --                       | 305/5   | 313/12  |      |  |
|                                      |                                                      | Other Output  | --                       | 305/10  | 313/16  |      |  |
|                                      | 48VDC nominal input series,nominal input voltage     |               | --                       | 156/5   | 160/12  |      |  |
| Reflected Ripple Current             |                                                      |               | --                       | 50      | --      |      |  |
| Impulse Voltage                      | 5VDC nominal input series                            |               | -0.7                     | --      | 12      | VDC  |  |
|                                      | 12VDC nominal input series                           |               | -0.7                     | --      | 25      |      |  |
|                                      | 24VDC nominal input series                           |               | -0.7                     | --      | 50      |      |  |
|                                      | 48VDC nominal input series                           |               | -0.7                     | --      | 100     |      |  |
| Starting Voltage                     | 5VDC nominal input series                            |               | --                       | --      | 4.5     |      |  |
|                                      | 12VDC nominal input series                           |               | --                       | --      | 9       |      |  |
|                                      | 24VDC nominal input series                           |               | --                       | --      | 18      |      |  |
|                                      | 48VDC nominal input series                           |               | --                       | --      | 36      |      |  |
| Undervoltage Protection              | 5VDC nominal input series                            |               | --                       | --      | 4.5     |      |  |
|                                      | 12VDC nominal input series                           |               | 5.5                      | 6.5     | --      |      |  |
|                                      | 24VDC nominal input series                           |               | 12                       | 15.5    | --      |      |  |
|                                      | 48VDC nominal input series                           |               | 26                       | 30      | --      |      |  |
| Input Filter                         |                                                      |               | Capacitance Filter       |         |         |      |  |
| Hot Plug                             |                                                      |               | Unavailable              |         |         |      |  |
| CTRL                                 | Module off                                           |               | 0-1.2V turn off          |         |         |      |  |
|                                      | Module on                                            |               | No connect or 3.5-12V on |         |         |      |  |

## Output Specifications

| Item                     | Operating Conditions                                 |                      | Min.                      | Typ. | Max.  | Unit  |
|--------------------------|------------------------------------------------------|----------------------|---------------------------|------|-------|-------|
| Output Voltage Accuracy  | 5% - 100% Load                                       |                      | --                        | ±1.0 | ±2.0  | %     |
| Linear Regulation        | Full load,Input voltage from low limit to high limit |                      | --                        | ±0.5 | ±1.0  |       |
| Load Regulation          | 5% - 100% Load                                       |                      | --                        | ±0.5 | ±1.5  |       |
| Transient Recovery Time  | 25% load step change                                 |                      | --                        | 0.3  | 0.5   | ms    |
| Transient Response       |                                                      | 3.3V、 5V output      | --                        | ±5   | ±8    | %     |
| Deviation                |                                                      | Other voltage output | --                        | ±3   | ±5    |       |
| Temperature 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 |
|---------------------------------------------------|-----------------------------------------------------------------|---------|------|------|------|
| Insulation 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                             | Derating when operating temperature ≥ 85°C,<br>(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                                | --      | 500  | --   | kHz  |
| MTBF                                              | MIL-HDBK-217F@25°C                                              | >1000Kh |      |      |      |

## Mechanical Specifications

|                    |                                                             |
|--------------------|-------------------------------------------------------------|
| Case Material      | Black plastic; flame-retardant and heat-resistant (UL94V-0) |
| Package Dimensions | 22.00 * 9.50 * 12.00 mm                                     |
| Weight             | 4.6g(Typ.)                                                  |
| 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<br>perf.Criteria B                                                          |
|     | RS    | IEC/EN61000-4-3 10V/m<br>Perf.Criteria A                                                                 |
|     | EFT   | IEC/EN61000-4-4 ±2KV<br>(The recommended circuit is shown in Figure 3-①)<br>Perf.Criteria B              |
|     | Surge | IEC/EN61000-4-5 line to line ±2KV<br>(The recommended circuit is shown in Figure 3-①)<br>Perf.Criteria B |
|     | CS    | IEC/EN61000-4-6 3 Vr.m.s<br>Perf.Criteria A                                                              |

## Typical Characteristic Curves

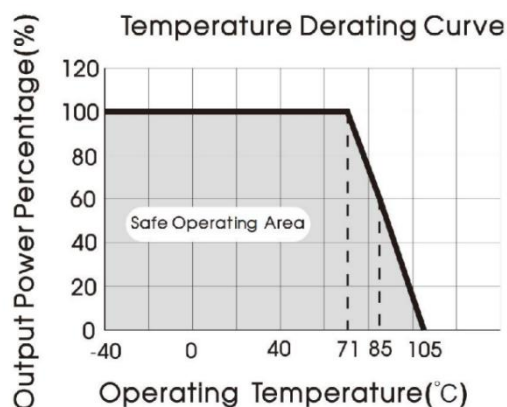
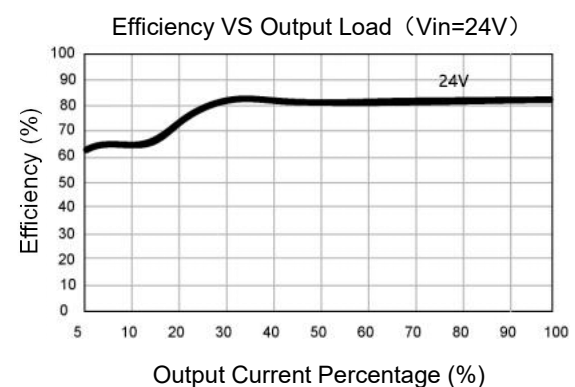
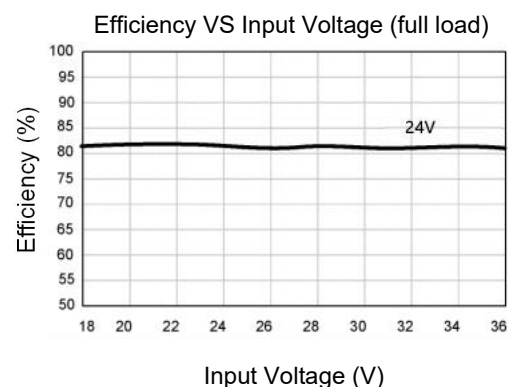
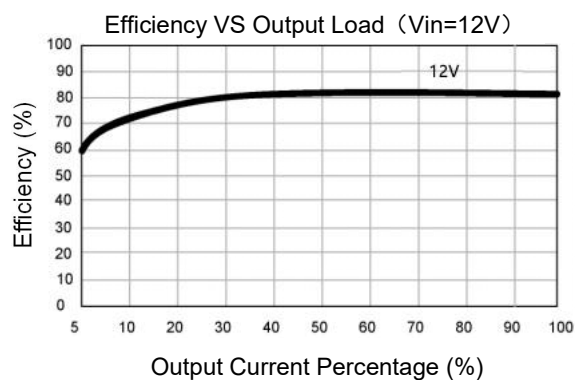
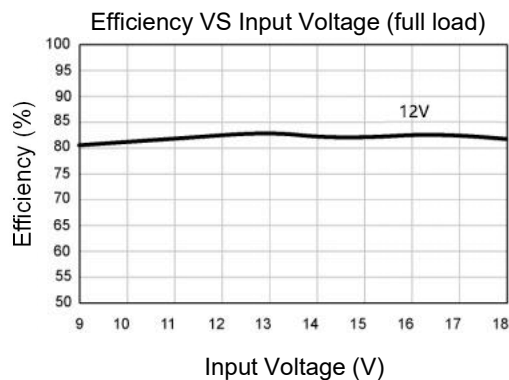


Fig. 1



## Circuit Design and Application

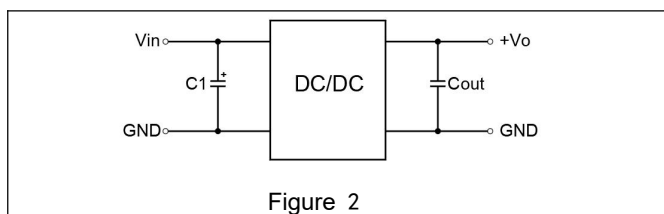


Figure 2

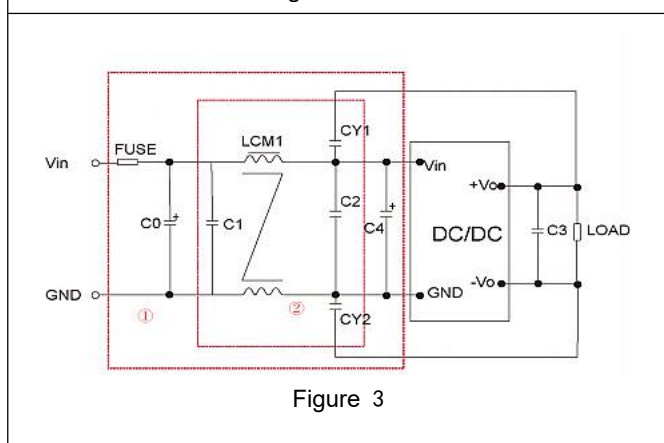


Figure 3

Recommended Capacitive Load Value Table

| Cin(μF) | Cout(μF) |
|---------|----------|
| 100     | 22       |

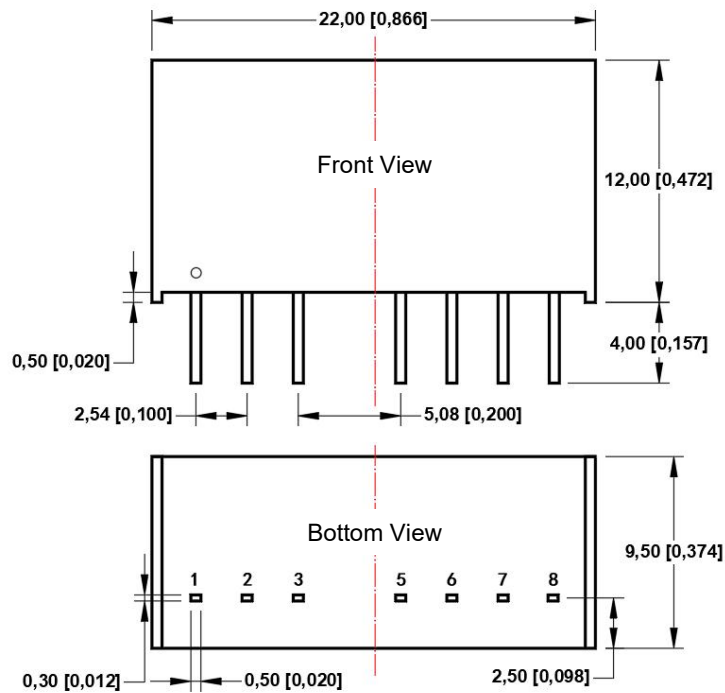
EMI Recommended Parameter Table

| Model   | Vin:12V                                                      | Vin:24V   |
|---------|--------------------------------------------------------------|-----------|
| FUSE    | Select according to the actual input current of the customer |           |
| C0、C4   | 330uF/35V                                                    | 330uF/50V |
| C1、C2   | 10μF/50V                                                     |           |
| LCM1    | 1.4-1.7mH                                                    |           |
| C3      | 22μF/50V                                                     |           |
| CY1、CY2 | 1nF/400VAC                                                   |           |

Note: Part 1 in Figure 3 is for EMC testing; The second part is used for EMI filtering, which can be selected according to the demand.

## Dimensions and Recommended Layout

Dimensions

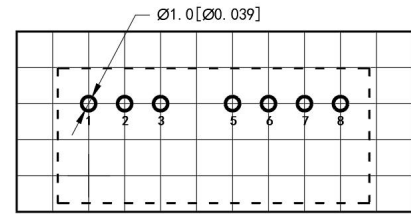


Note:

Unit: mm[inch]

Pin section tolerances:  $\pm 0.10 [\pm 0.004]$ General tolerances:  $\pm 0.50 [\pm 0.020]$ 

PCB Printing Layout &amp; 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   | -Vo               | COM               |
| 8   | NC                | -Vo               |

NC: Pin to be isolated from circuitry

**Note:**

1. The input voltage cannot exceed the specified range value, otherwise permanent and irreparable damage may be caused ;
2. Unless otherwise specified, the parameters in this datasheet were measured at 25°C, humidity 40%~75%, input nominal voltage and output pure resistance mode under full load;
3. All index test methods are based on our company's enterprise standards.

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