

## Product Feature

1. Continuous short-circuit protection
2. No-load input current as low as 8mA
3. Operating ambient temperature range: -40°C to +85°C
4. High efficiency up to 75%
5. I/O isolation test voltage 3k VDC
6. Industry standard pin-out



3 years  
Warranty

## Selection Guide

| Part No.        | Input Voltage (VDC) | Output        |                        | Full Load Efficiency (%) Min./Typ. | Capacitive Load (μF) Max. |
|-----------------|---------------------|---------------|------------------------|------------------------------------|---------------------------|
|                 | Nominal (Range)     | Voltage (VDC) | Current (mA) Max./Min. |                                    |                           |
| AMIF0503LS-1WR3 | 5<br>(4.75-5.25)    | 3.3           | 250/25                 | 63/67                              | 2400                      |
| AMIF0505LS-1WR3 |                     | 5             | 200/20                 | 66/70                              | 2400                      |
| AMIF1205LS-1WR3 | 12<br>(11.4-12.6)   | 5             | 200/20                 | 69/73                              | 2400                      |
| AMIF1209LS-1WR3 |                     | 9             | 111/12                 | 69/73                              | 1000                      |
| AMIF1212LS-1WR3 |                     | 12            | 83/9                   | 69/73                              | 560                       |
| AMIF1215LS-1WR3 |                     | 15            | 67/7                   | 71/75                              | 560                       |
| AMIF1505LS-1WR3 | 15<br>(14.25-15.75) | 5             | 200/20                 | 69/73                              | 2400                      |
| AMIF1515LS-1WR3 |                     | 15            | 67/7                   | 71/75                              | 560                       |
| AMIF2403LS-1WR3 | 24<br>(22.8-25.2)   | 3.3           | 250/25                 | 65/71                              | 2400                      |
| AMIF2405LS-1WR3 |                     | 5             | 200/20                 | 67/73                              | 2400                      |
| AMIF2409LS-1WR3 |                     | 9             | 111/12                 | 67/73                              | 1000                      |
| AMIF2412LS-1WR3 |                     | 12            | 83/9                   | 67/73                              | 560                       |
| AMIF2415LS-1WR3 |                     | 15            | 67/7                   | 67/73                              | 560                       |

## Input Specifications

| Item                                | Operating Conditions |                              | Min.               | Typ.  | Max.   | Unit |
|-------------------------------------|----------------------|------------------------------|--------------------|-------|--------|------|
| Input Current (full load / no-load) | 5V input             | 3.3VDC/5VDC output           | --                 | 286/8 | 303/-- | mA   |
| Input Current (full load / no-load) | 12V input            | 5VDC/9VDC/12VDC output       | --                 | 115/8 | 121/-- | mA   |
|                                     |                      | 15VDC output                 | --                 | 112/8 | 118/-- |      |
|                                     | 15V input            | 5VDC output                  | --                 | 92/8  | 97/--  |      |
|                                     |                      | 15VDC output                 | --                 | 89/8  | 94/--  |      |
|                                     | 24V input            | 3.3VDC output                | --                 | 59/8  | 65/--  |      |
|                                     |                      | 5VDC/9VDC/12VDC/15VDC output | --                 | 58/8  | 63/--  |      |
| Reflected Ripple Current*           |                      |                              | --                 | 15    | --     |      |
| Input Filter                        |                      |                              | Capacitance Filter |       |        |      |
| Hot Plug                            |                      |                              | Unavailable        |       |        |      |

Note: \* Refer to DC-DC Converter Application Notes for detailed description of reflected ripple current test method.

## Output Specifications

| Item              | Operating Conditions      |               | Min. | Typ. | Max.  | Unit |
|-------------------|---------------------------|---------------|------|------|-------|------|
| Voltage Accuracy  |                           |               | --   | --   | ±3    | %    |
| Linear Regulation | Input voltage change: ±1% |               | --   | --   | ±0.25 |      |
|                   |                           | 3.3VDC output | --   | --   | ±3    |      |

|                                                                                                                                                    |                 |              |              |                           |       |     |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------|--------------|---------------------------|-------|-----|-------|
| Load Regulation                                                                                                                                    | 10%-100% load   | Other output |              | --                        | --    | ±2  |       |
| Ripple & Noise*                                                                                                                                    | 20MHz bandwidth | 5V input     |              | --                        | 30    | 75  | mVp-p |
|                                                                                                                                                    |                 | Other input  | Other output | --                        | 30    | 100 |       |
|                                                                                                                                                    |                 |              | 15VDC output | --                        | 80    | 150 |       |
| Temperature Coefficient                                                                                                                            | 100% load       |              |              | --                        | ±0.02 | --  | %/°C  |
| Short-circuit Protection                                                                                                                           |                 |              |              | Continuous, self-recovery |       |     |       |
| Note: * The “parallel cable” method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information. |                 |              |              |                           |       |     |       |

## General Specifications

| Item                                 | Operating Conditions                                                                |             |               | Min.                                   | Typ. | Max. | Unit    |
|--------------------------------------|-------------------------------------------------------------------------------------|-------------|---------------|----------------------------------------|------|------|---------|
| Isolation                            | Input-output electric strength test for 1 minute with a leakage current of 1mA max. |             |               | 3000                                   | --   | --   | VDC     |
| Insulation Resistance                | Input-output resistance at 500VDC                                                   |             |               | 1000                                   | --   | --   | MΩ      |
| Isolation Capacitance                | Input-output capacitance at 100kHz/0.1V                                             |             |               | --                                     | 20   | --   | pF      |
| Operating Temperature                | Derating when operating temperature≥ 71℃ (see Fig.1)                                |             |               | -40                                    | --   | 85   | ℃       |
| Storage Temperature                  |                                                                                     |             |               | -55                                    | --   | 125  |         |
| Case Temperature Rise                | Ta=25℃                                                                              | 5V input    | 3.3VDC output | --                                     | 30   | --   |         |
|                                      |                                                                                     |             | Other output  | --                                     | 25   | --   |         |
|                                      |                                                                                     | Other input |               | --                                     | 25   | --   |         |
| Pin Soldering Resistance Temperature | Soldering spot is 1.5mm away from case for 10 seconds                               |             |               | --                                     | --   | 300  |         |
| Storage Humidity                     | Non-condensing                                                                      | 5V input    |               | --                                     | --   | 95   | %RH     |
|                                      |                                                                                     | Other input |               | 5                                      | --   | 95   |         |
| Vibration                            | 5V input                                                                            |             |               | 10-150Hz, 5G, 30 Min. along X, Y and Z |      |      |         |
|                                      | 12/15/24VDC input                                                                   |             |               | 10-150Hz, 5G, 0.75mm. along X, Y and Z |      |      |         |
| Switching Frequency                  | 100% load, nominal input voltage                                                    |             | 5V input      | --                                     | 300  | --   | kHz     |
|                                      |                                                                                     |             | Other input   | --                                     | 260  | --   |         |
| MTBF                                 | MIL-HDBK-217F@25℃                                                                   |             |               | 3500                                   | --   | --   | k hours |

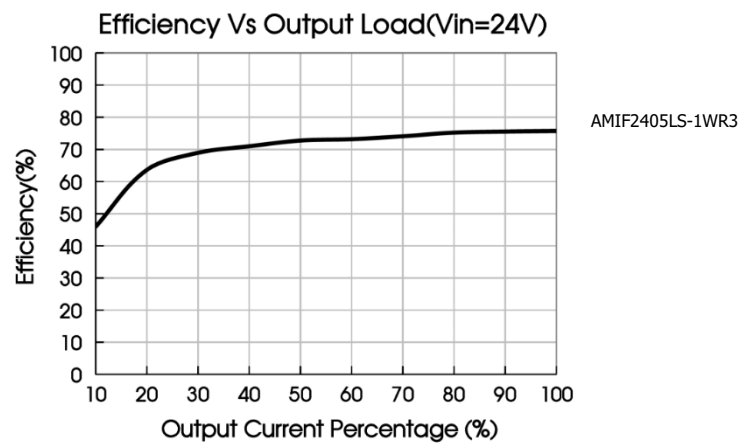
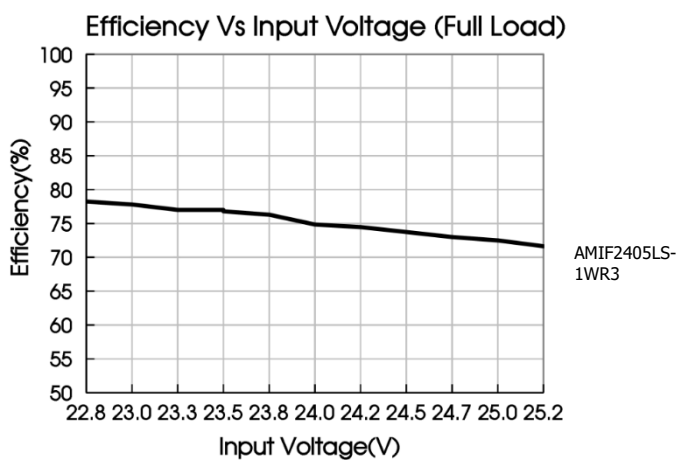
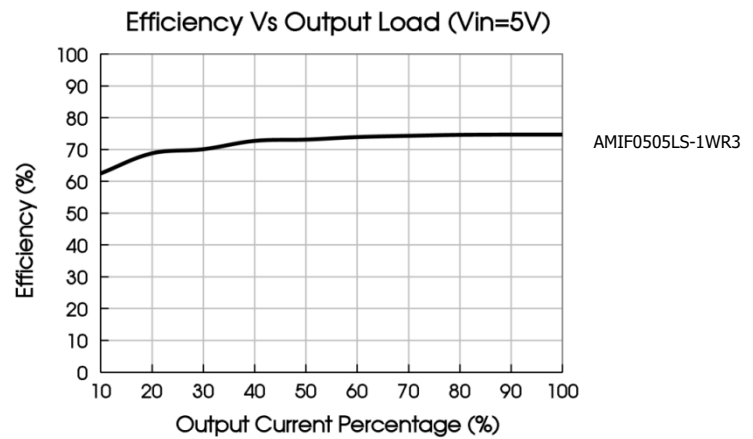
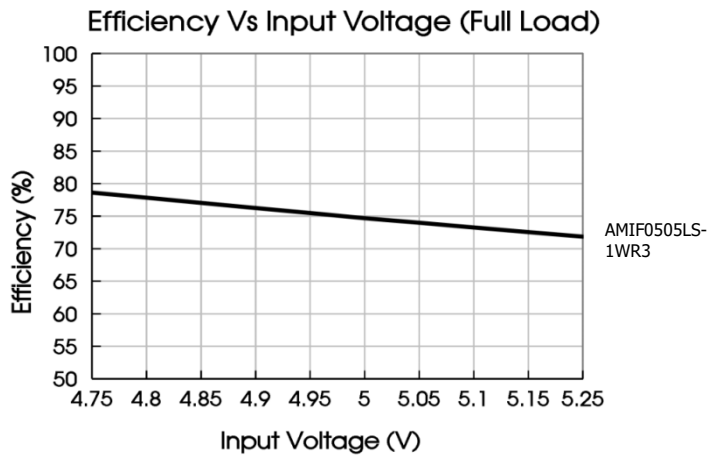
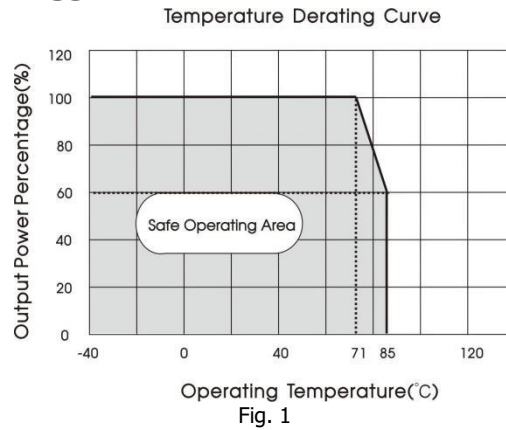
## Mechanical Specifications

|                |                                                             |
|----------------|-------------------------------------------------------------|
| Case Material  | Black plastic; flame-retardant and heat-resistant (UL94V-0) |
| Dimensions     | 19.65 x 6.00 x 10.16mm                                      |
| Weight         | 2.1g(Typ.)                                                  |
| Cooling Method | Free air convection                                         |

## EMC Specifications

|                                                     |     |                                                         |
|-----------------------------------------------------|-----|---------------------------------------------------------|
| Emissions                                           | CE  | CISPR32/EN55032 CLASS B                                 |
|                                                     | RE  | CISPR32/EN55032 CLASS B                                 |
| Immunity                                            | ESD | IEC/EN61000-4-2 Air ±8kV, Contact ±6kV perf. Criteria B |
| Note: Refer to Fig. 3 for recommended circuit test. |     |                                                         |

### Typical Characteristic Curves



### Typical Circuit Design And Application

#### 1. Typical application circuit

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig. 2.

Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.

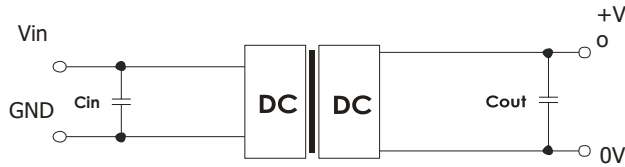


Fig. 2

Table 1: Recommended input and output capacitor values

| Vin   | Cin       | Vo     | Cout      |
|-------|-----------|--------|-----------|
| 5VDC  | 4.7μF/16V | 3.3VDC | 10μF/16V  |
| 12VDC | 2.2μF/25V | 5VDC   | 10μF/16V  |
| 15VDC | 2.2μF/25V | 9VDC   | 2.2μF/16V |
| 24VDC | 1μF/50V   | 12VDC  | 2.2μF/25V |
| --    | --        | 15VDC  | 1μF/25V   |

#### 2. EMC compliance circuit

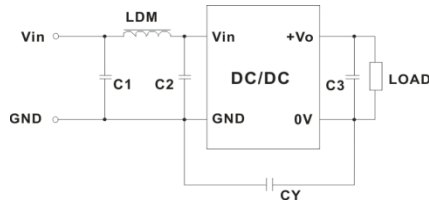
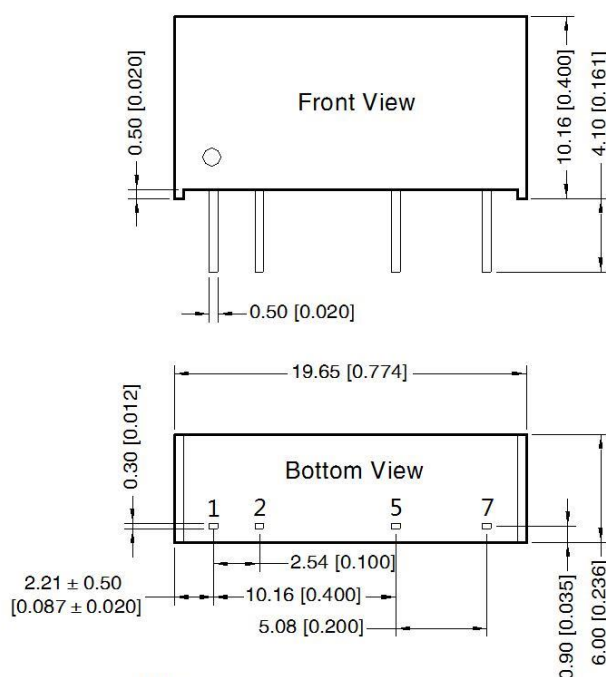


Fig. 3

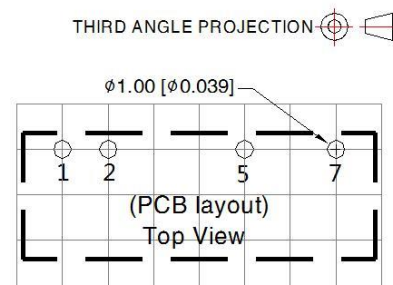
Table 2: Recommended EMC filter values

| Input voltage |       | 5VDC                         | Other input |
|---------------|-------|------------------------------|-------------|
| EMI           | C1/C2 | 4.7μF /25V                   | 4.7μF /50V  |
|               | CY    | 100pF /4kV                   | 270pF/3kV   |
|               | C3    | Refer to the Cout in table 1 |             |
|               | LDM   | 6.8μH                        |             |

### Dimensions and Recommended Layout



Note:  
Unit: mm[inch]  
Pin section tolerances:  $\pm 0.10 [\pm 0.004]$   
General tolerances:  $\pm 0.25 [\pm 0.010]$



Note: Grid 2.54\*2.54mm

| Pin-Out |      |
|---------|------|
| Pin     | Mark |
| 1       | Vin  |
| 2       | GND  |
| 5       | 0V   |
| 7       | +Vo  |

**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 Ta=25°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;