

## Features

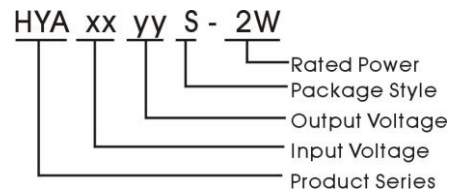
- ★ 8 PIN SIP Package
- ★ 2:1 wide input voltage range
- ★ 1000 VDC isolation    Short Circuit Protection
- ★ Temperature Range:-40℃ to +85℃
- ★ UL94V-0 Inflaming retarding package
- ★ MTBF>1 million hours(25℃)
- ★ Without overshoot when turning On/Off



## Applications

The HYA\_S-2W Series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board. For these DC-DC converters, You can reduce the design point of failure and save the development of micro power supply's manpower, material land time costs, also better ensure product quality stability, protect safety and reliability of the end of products. These products apply to where:

- 1) Input voltage range  $\leq 2:1$ ;
- 2) Input and output isolation  $\leq 1$  KVDC;
- 3) Regulated and low ripple noise is required.



## Model Detail List Specification

| Model Number | Input Voltage range<br>(nominal voltage) | Output Voltage | Output Current <sub>(mA)</sub> |      | Input Current Full load <sub>(mA)</sub> |     | Efficiency | Max. Capacitive Load <sub>(μF)</sub> |
|--------------|--|----------------|--------------------------------|------|---|-----|------------|--------------------------------------|
|              |  |                | Min.                           | Max. | Max.                                    | No. |            |                                      |
| HYA0505S-2W  | 4.5~9VDC<br>(5 VDC)                      | ±5.0V          | ±20                            | ±200 | 243                                     | 25  | 82%        | 200                                  |
| HYA0509S-2W  |  | ±9.0V          | ±11                            | ±111 | 240                                     |     | 83%        |                                      |
| HYA0512S-2W  |  | ±12.0V         | ±8                             | ±83  | 237                                     |     | 84%        |                                      |
| HYA0515S-2W  |  | ±15.0V         | ±6                             | ±67  | 236                                     |     | 85%        |                                      |
| HYA1205S-2W  | 9~18VDC<br>(12 VDC)                      | ±5.0V          | ±20                            | ±200 | 101                                     | 12  | 82%        |                                      |
| HYA1209S-2W  |  | ±9.0V          | ±11                            | ±111 | 100                                     |     | 83%        |                                      |
| HYA1212S-2W  |  | ±12.0V         | ±8                             | ±83  | 98                                      |     | 84%        |                                      |
| HYA1215S-2W  |  | ±15.0V         | ±6                             | ±67  | 98                                      |     | 85%        |                                      |
| HYA2405S-2W  | 18~36VDC<br>(24 VDC)                     | ±5.0V          | ±20                            | ±200 | 52                                      | 6   | 80%        |                                      |
| HYA2409S-2W  |  | ±9.0V          | ±11                            | ±111 | 50                                      |     | 82%        |                                      |
| HYA2412S-2W  |  | ±12.0V         | ±8                             | ±83  | 50                                      |     | 82%        |                                      |
| HYA2415S-2W  |  | ±15.0V         | ±6                             | ±67  | 50                                      |     | 83%        |                                      |
| HYA4805S-2W  | 36~72VDC<br>(48 VDC)                     | ±5.0V          | ±20                            | ±200 | 25                                      | 4   | 83%        |                                      |
| HYA4809S-2W  |  | ±9.0V          | ±11                            | ±111 | 24                                      |     | 84%        |                                      |
| HYA4812S-2W  |  | ±12.0V         | ±8                             | ±83  | 24                                      |     | 85%        |                                      |
| HYA4815S-2W  |  | ±15.0V         | ±6                             | ±67  | 24                                      |     | 86%        |                                      |

## Output Specifications

| Item                     | Test Conditions             | Min.                           | Typ.       | Max.       | Unit                  |
|--------------------------|-----------------------------|--------------------------------|------------|------------|-----------------------|
| Output Power             |                             | 0.2                            |            | 2          | W                     |
| Line Voltage Regulation  | For Vin change of $\pm 1\%$ |                                |            | $\pm 2$    | %                     |
| Load regulation          | 10% to 100% load            |                                | 0.01       | 0.02       |                       |
|                          |                             |                                | 0.01       | 0.02       |                       |
|                          |                             |                                | 0.01       | 0.02       |                       |
|                          |                             |                                | 0.01       | 0.02       |                       |
| Ripple                   | 20MHz Bandwidth             |                                | 10         |            | mVp-p                 |
| Noise                    |                             |                                | 20         |            |                       |
| Temperature Drift        | 100% full load              |                                | $\pm 0.02$ | $\pm 0.03$ | $\%/^{\circ}\text{C}$ |
| Short Circuit Protection |                             | Continuous, automatic recovery |            |            |                       |
| Input Filter             |                             | C Filter                       |            |            |                       |

## Common Specifications

| Item                  | Test Conditions  | Min. | Typ. | Max. | Unit       |
|-----------------------|--|------|------|------|------------|
| Isolation Voltage     | Tested for 1 minute and leakage current less than 1 mA | 1000 |      |      | VDC        |
| Switching Frequency   | Full load, nominal input                               |      | 100  | 300  | KHz        |
| MTBF                  | MIL-HDBK-217F@25 $^{\circ}\text{C}$                    | 1000 |      |      | K hours    |
| Isolation Resistance  | Test at 500VDC   | 1000 |      |      | M $\Omega$ |
| Isolation Capacitance |  |      | 350  |      | PF         |
| Weight                |  |      | 4.0  |      | g          |

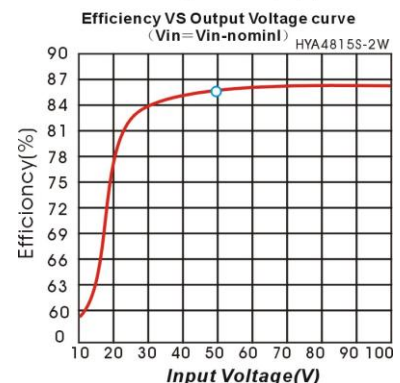
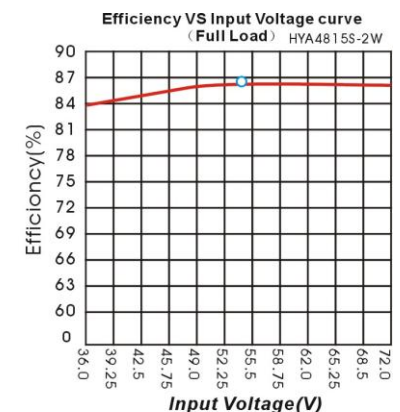
## Environmental Specifications

| Item                    | Test Conditions                | Min.                | Typ. | Max. | Unit |
|-------------------------|--------------------------------|---------------------|------|------|------|
| Storage Humidity        | Non condensing                 |                     |      | 95   | %    |
| Temp. rise at full load |                                |                     | 25   |      | ℃    |
| Operating Temperature   |                                | -45                 |      | +85  |      |
| Storage Temperature     | Power derating (above 85℃)     | -55                 |      | +125 |      |
| Soldering Temperature   | 1.5mm from case for 10 seconds |                     | 300  |      |      |
| Cooling                 |                                | Free air convection |      |      |      |

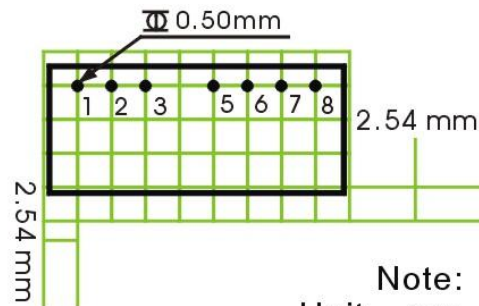
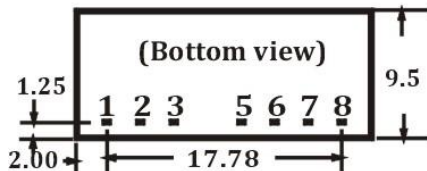
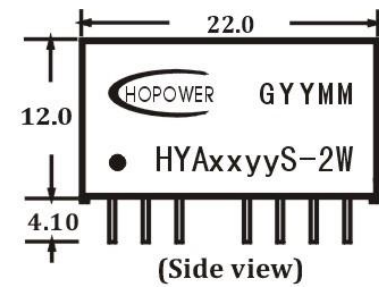
## Input Specifications

| Item                                  | Test Conditions       | Min. | Typ. | Max. | Unit |
|---------------------------------------|-----------------------|------|------|------|------|
| Input Max. voltage                    | 5 VDC Input (4.5~9V)  |      |      | 12   | VDC  |
|                                       | 12 VDC Input (9~18V)  |      |      | 25   |      |
|                                       | 24 VDC Input (18~36V) |      |      | 50   |      |
|                                       | 48 VDC Input (36~72V) |      |      | 100  |      |
| Input surge voltage<br>(1 sec. Max. ) | 5 VDC Input (4.5~9V)  | 4.5  |      |      | VDC  |
|                                       | 12 VDC Input (9~18V)  | 9    |      |      |      |
|                                       | 24 VDC Input (18~36V) | 18   |      |      |      |
|                                       | 48 VDC Input (36~72V) | 36   |      |      |      |

## Product typical Curve



## Mechanical Dimensions & Recommended Footprint

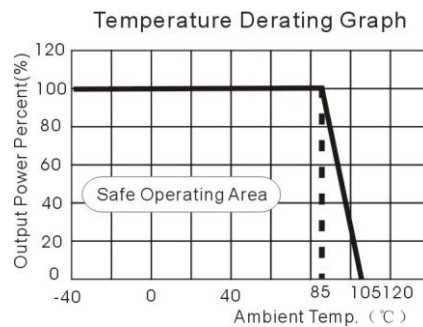


Note:  
Unit: mm

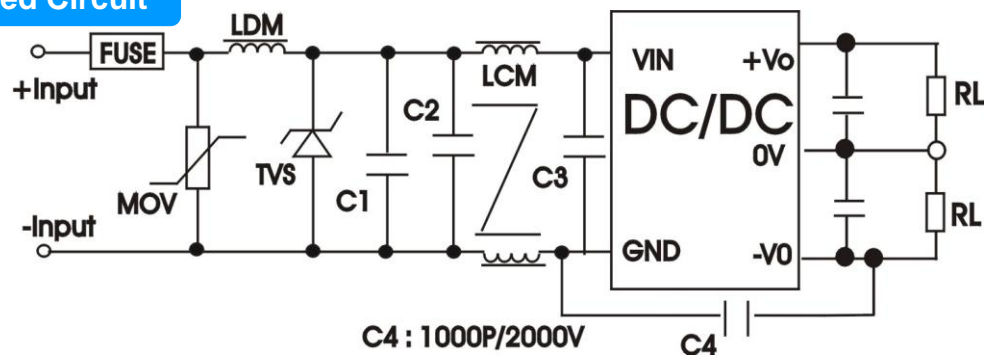
General tolerances : 0.20mm

| Package | Vin | GND | CTRL | -Vo | OV | +Vo | NC |
|---------|-----|-----|------|-----|----|-----|----|
| HYAS    | 2   | 1   | 3    | 8   | 7  | 6   | 5  |

## Temperature Derating Graph



## EMC Recommended Circuit



## EMC Module Application Circuit

