

**PRELIMINARY**

Notice: This is not a final specification  
Some parametric limits are subject to change

**YS051DD-12****HYBRID IC FOR ON-BOARD POWER SUPPLY****DESCRIPTION**

The YS051DD-12 is a thin-profile and lightweight dual-output DC-DC converter. Its output power is 1.5W and the input is insulated from the output. With an over-current protection circuit built-in, the YS051DD-12 is an optimum solution for onboard power supplies in FA, OA, and control equipment.

**FEATURES**

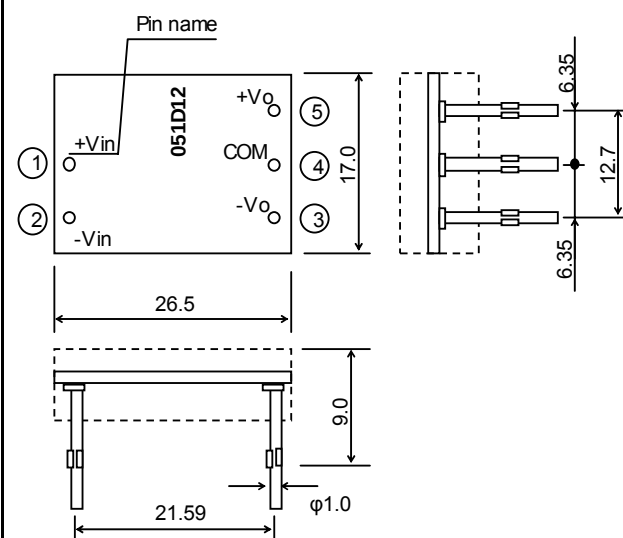
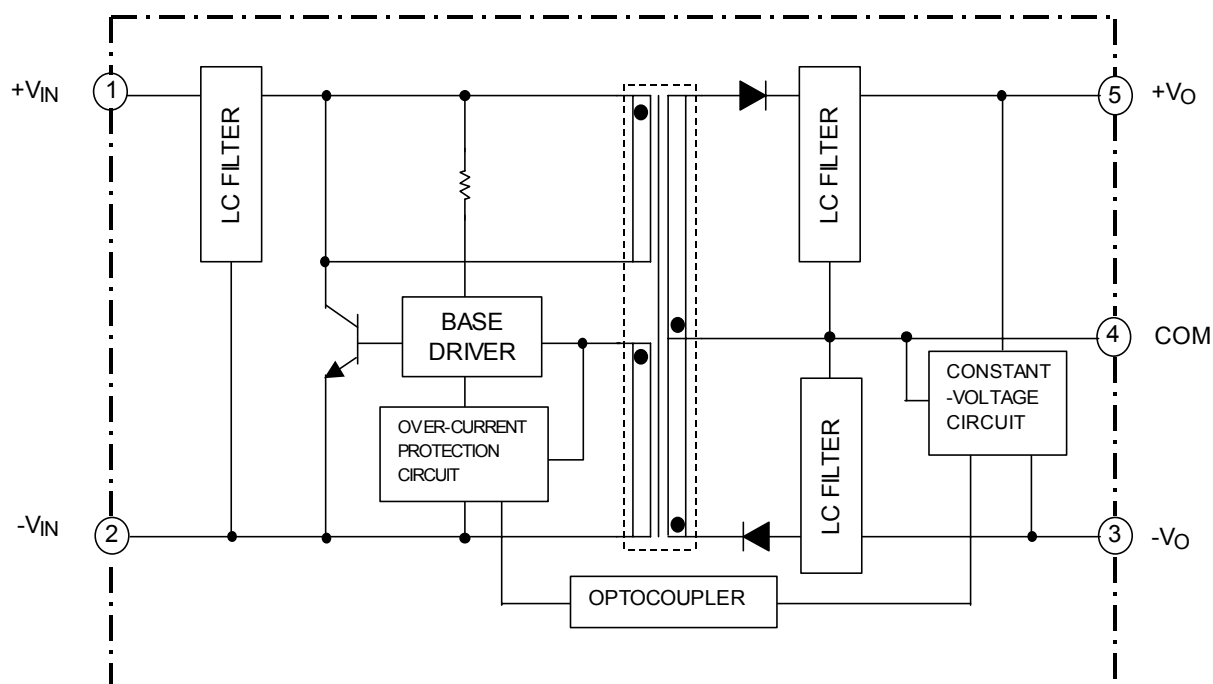
- Input voltage range: 4.5 to 9V DC
- Output:  $\pm 12V$ , 65mA (output power: 1.56W)
- Thin-profile and lightweight design
- Insulation between input and output: 500V DC, 1min
- Built-in over-current protection circuit

**APPLICATIONS**

Best suited to onboard power supplies in FA, OA, and control equipment.

**OUTLINE DRAWING**

Dimensions: mm

**BLOCK DIAGRAM**

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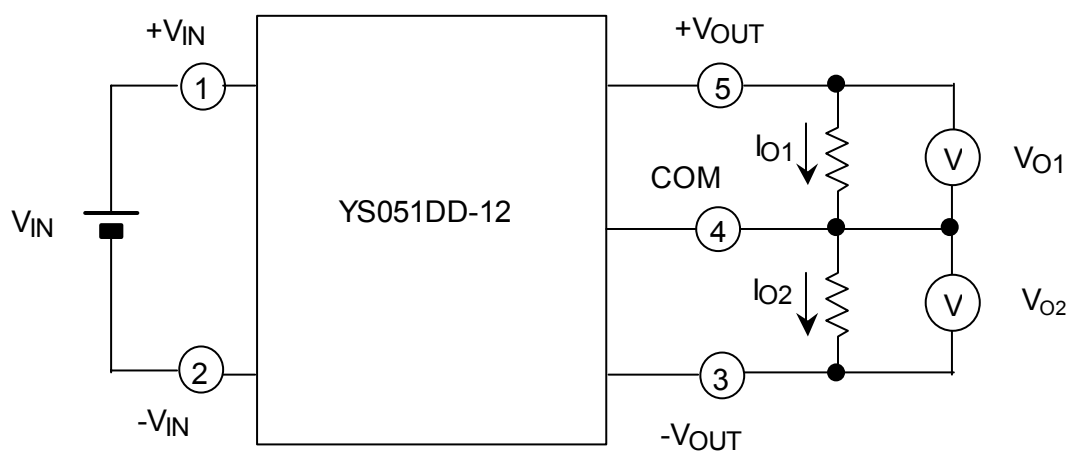
**HYBRID IC FOR ON-BOARD POWER SUPPLY****MAXIMUM RATINGS** (unless otherwise noted,  $T_a=25^{\circ}\text{C}$ )

| Symbol    | Parameter                      | Conditions            | Ratings        | Unit               |
|-----------|--------------------------------|-----------------------|----------------|--------------------|
| $V_{IN}$  | Input voltage                  | Between: pins 2 and 1 | 9              | V                  |
| $I_{O1}$  | Output current                 | Between pins 5 and 4  | 65             | mA                 |
| $I_{O2}$  |                                | Between pins 4 and 3  | 65             |                    |
| $P_O$     | Output power                   | —                     | 1.56           | W                  |
| $T_{opr}$ | Operating temperature          | No condensation (*1)  | $-10 \sim +70$ | $^{\circ}\text{C}$ |
| $T_{stg}$ | Storage temperature            | No condensation       | $-20 \sim +85$ | $^{\circ}\text{C}$ |
| $V_{iso}$ | Input-output isolation voltage | DC, 1min              | 500            | V                  |

(\*1) Please refer to derating curve.

**ELECTRICAL CHARACTERISTICS** (unless otherwise noted,  $V_{IN}=5\text{V}$ ,  $T_a=25^{\circ}\text{C}$ )

| Symbol    | Parameter        | Test conditions                                            | Limits |       |       | Unit |
|-----------|------------------|------------------------------------------------------------|--------|-------|-------|------|
|           |                  |                                                            | MIN.   | TYP.  | MAX.  |      |
| $V_{IN}$  | Input voltage    | Recommended range                                          | 4.5    | 5.0   | 9.0   | V    |
| $V_{O1}$  | Output voltage   | $I_{O1}=0 \sim 65\text{mA}$                                | 11.4   | 12.0  | 12.6  | V    |
| $V_{O2}$  |                  | $I_{O2}=0 \sim 65\text{mA}$                                | -12.6  | -12.0 | -11.4 |      |
| Reg-I     | Input regulation | $I_{O1}, I_{O2}=65\text{mA}$ , $V_{IN}=4.5 \sim 9\text{V}$ | —      | —     | 60    | mV   |
| Reg-L     | Load regulation  | $I_O=0 \sim 65\text{mA}$                                   | —      | —     | 600   | mV   |
| $V_{P-P}$ | Ripple voltage   | $I_{O1}, I_{O2}=65\text{mA}$                               | —      | —     | 120   | mV   |
| $\eta$    | Efficiency       | $I_{O1}, I_{O2}=65\text{mA}$                               | —      | 67    | —     | %    |

**TEST CIRCUIT DIAGRAM**

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**YS051DD-12****HYBRID IC FOR ON-BOARD POWER SUPPLY****FOR SAFETY USING**

Great detail and careful attention are given to the production activity of Hics, such as the development, the quality of production, and in its reliability. However the reliability of Hics depends not only on their own factors but also in their condition of usage. When handling Hics, please note the following cautions.

| CAUTIONS         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Packing          | The materials used in packing Hics can only withstand normal external conditions. When exposed to outside shocks, rain and certain environmental contaminants, the packing materials will deteriorates. Please take care in handling.                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Carrying         | <ol style="list-style-type: none"> <li>1) Don't stack boxes too high. Avoid placing heavy materials on boxes.</li> <li>2) Boxes must be positioned correctly during transportation to avoid breakage.</li> <li>3) Don't throw or drop boxes.</li> <li>4) Keep boxes dry. Avoid rain or snow.</li> <li>5) Minimal vibration and shock during transportation is desirable.</li> </ol>                                                                                                                                                                                                                                                                      |
| Storage          | <p>When storing Hics, please observe the following notices or possible deterioration of their electrical characteristics, risk of solderability, and external damage may occur.</p> <ol style="list-style-type: none"> <li>1) Devices must be stored where fluctuation of temperature and humidity is minimal, and must not be exposed to direct sunlight. Store at the normal temperature of 5 to 30 degrees Celsius with humidity at 40 to 60%.</li> <li>2) Avoid locations where corrosive gasses are generated or where much dust accumulates.</li> <li>3) Storage cases must be static proof.</li> <li>4) Avoid putting weight on boxes.</li> </ol> |
| Extended storage | When extended storage is necessary, Hics must be kept non-processed. When using Hics which have been stored for more than one year or under severe conditions, be sure to check that the exterior is free from flaw and other damages.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Maximum ratings  | To prevent any electrical damages, use Hics within the maximum ratings. The temperaqtue, current, voltage, etc. must not exceed these conditions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Polarity         | To protect Hics from destruction and deterioration due to wrong insertion, make sure of polarity in inserting leads into the board holes, conforming to the external view for the terminal arrangement.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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**YS051DD-12****HYBRID IC FOR ON-BOARD POWER SUPPLY**

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**Keep safety first in your circuit designs!**

- ISAHAYA Electronics Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (1) placement of substitutive, auxiliary circuits, (2) use of non-flammable material or (3) prevention against any malfunction or mishap.

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