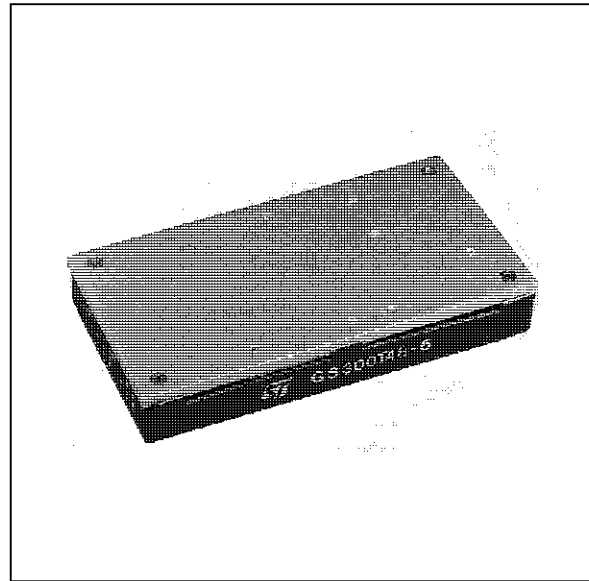


300W DC-DC CONVERTER

| Type | V _i | V _o | I _o |
|------------|----------------|----------------|----------------|
| GS300T48-5 | 38 to 60 V | 5,075 V | 60 A |

FEATURES

- Very high output power (300W)
- High efficiency (80% min.)
- Parallel operation with current sharing
- Synchronization pin
- Remote ON/OFF
- Remote load voltage sense compensation
- Output short-circuit protection
- Output overvoltage protection
- Thermal protection
- Undervoltage lock-out
- Minimal overshoot during load transients
- 500 V_{DC} input to output isolation
- Internal input and output filtering
- Softstart
- PCB or chassis mountable



DESCRIPTION

The GS300T48-5 is a 300W DC-DC converters used to generate a 5.075V isolated output with a current of 60A from a wide range input voltage (38 to 60V).

SELECTION GUIDE

| Type Ordering Number | Input Voltage (V) | Output Voltage (V) | Output Current (A) | Dimensions L • W • H mm (inches) |
|---------------------------|----------------------|--------------------------|--------------------------|--|
| GS300T48-5 GS300T48-5E | 38 to 60 | 5.075 | 60 | 125 • 66.5 • 20 (4.92 • 2.62 • 0.79) The suffix E identifies the metric threading on the planar heatsink (see fig. 1). |

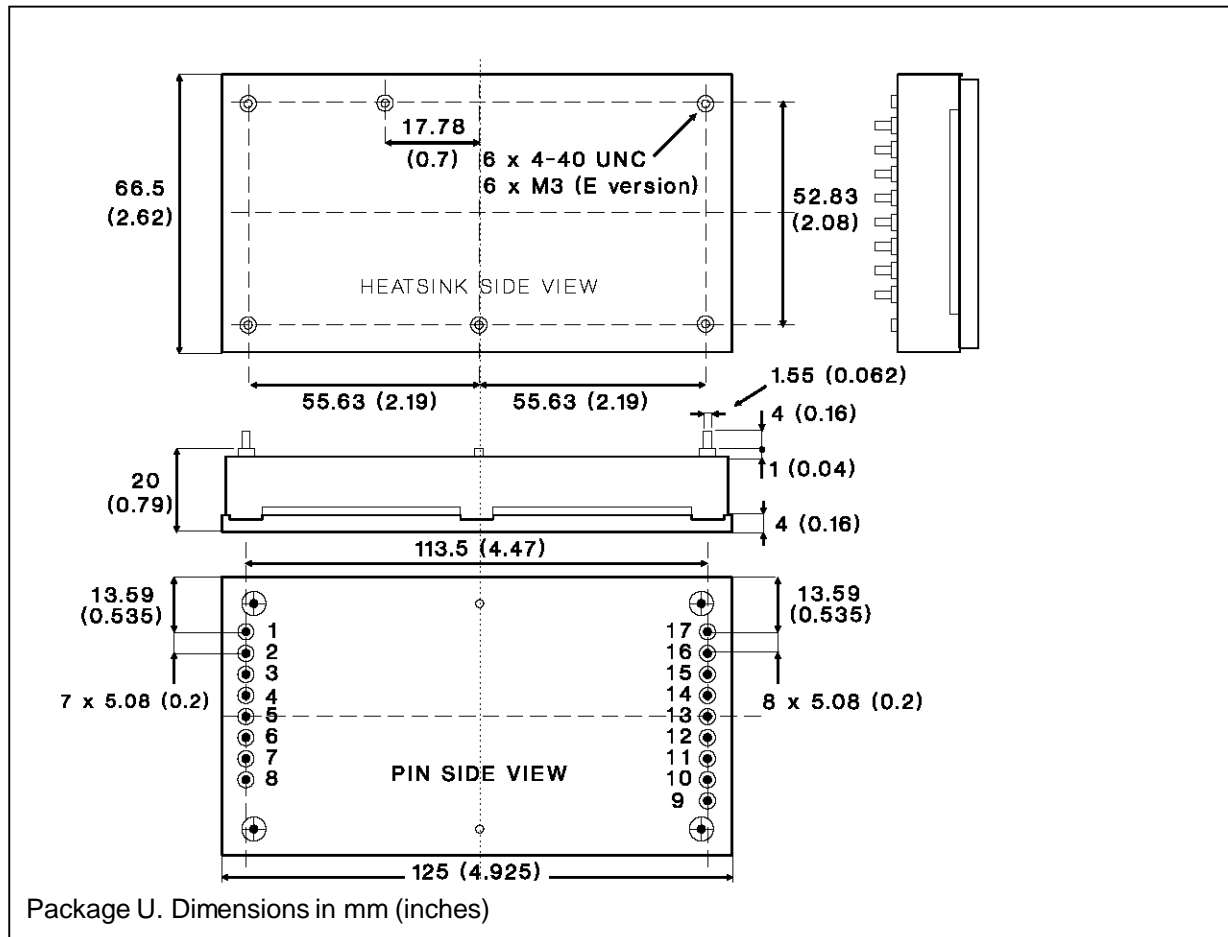
ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Unit |
|--------------|--|---|-------|-------|-------|----------------------|
| V_i | Input Voltage | $V_o = 5.075\text{V}$ $I_o = 0$ to 30A (Operating Conditions) | 38 | 48 | 60 | VDC |
| V_{iuv} | Input Undervoltage Lockout | $I_o = 0$ to 60A | 29 | | 36 | V |
| I_i | Average Input Current | $V_i = 48\text{V}$ $I_o = 60\text{A}$ | | | 7.8 | A |
| I_{ipk} | Inrush Transient Peak Current | $V_i = 60\text{V}$ $I_o = 60\text{A}$ | | | 0.3 | A^2s |
| I_{ir} | Reflected Input Current | $V_i = 48\text{V}$ $I_o = 60\text{A}$ BW = 5Hz to 20MHz (see fig. 2) | | | 30 | mApp |
| V_{ien} | Enable Input Voltage | $V_i = 38$ to 60V $I_o = 0$ to 60A | 0 | | 1.2 | V |
| I_{ien} | Enable Input Current | $V_i = 38$ to 60V $I_o = 0$ to 60A $V_{ien} = 0\text{V}$ | | | -1 | mA |
| V_{iinh} | Max Inhibit Voltage | $V_i = 38$ to 60V $I_o = 0$ to 60A $V_{ien} = \text{open}$ | 8 | | 18 | V |
| P_i | Input Power | $V_i = 38$ to 60V $I_o = 0\text{A}$ (No Load) | | 1.5 | 2 | W |
| V_o | Total Output Voltage Regulation | $V_i = 38$ to 60V $I_o = 0$ to 60A | 4.490 | 5.075 | 5.210 | V |
| V_{ost} | Short-term Output Voltage Regulation | $V_i = 38$ to 60V $I_o = 0$ to 60A | 5.002 | 5.075 | 5.148 | V |
| V_{ots} | Total Static Output Voltage Regulation | $V_i = 38$ to 60V $I_o = 0$ to 60A | 4.970 | 5.075 | 5.180 | V |
| V_{ol} | Output Overvoltage Limit Initiation | $V_i = 38$ to 60V $I_o = 0$ to 60A | | 6.3 | | V |
| V_{or} | Output Ripple Voltage | $V_i = 38$ to 60V $I_o = 60\text{A}$ BW = 0 to 20 Mhz | | | 50 | mVpp |
| V_{on} | Output Noise Voltage | $V_i = 38$ to 60V $I_o = 60\text{A}$ BW = 0 to 20 Mhz | | | 100 | mVpp |
| ΔV_o | Total Remote Sense Compensation | $V_i = 38$ to 60V | | | 0.6 | V |
| δV_o | Peak Load Transient Response | $V_i = 48\text{V}$ $\delta I_o = 10\text{A}$ slope = 0.1A/ μs | | | 100 | mVp |
| I_o | Output Current | $V_i = 38$ to 60V $V_o = 5\text{V}$ | 0 | | 60 | A |
| I_{ol} | Overcurrent Limit Initiation | $V_i = 48\text{V}$ | | 63 | | A |
| I_{osc} | Shortcircuit Output Current | $V_i = 48\text{V}$ | | 69 | | A |
| t_s | Load Transient Setting Time | $V_i = 48\text{V}$ $\delta I_o = 10\text{A}$ slope = 0.1A/ μs | | | 250 | μs |
| t_{on} | Turn-on Time | $V_i = 38$ to 60V $I_o = 0$ to 60A $V_{ien} = \text{from high to low}$ | | | 10 | ms |
| | | $V_i = 0$ to 60V $I_o = 0$ to 60A $V_{ien} = \text{low}$ | | | 10 | |
| V_{is} | Isolation Voltage | | 500 | | | V |
| f_s | Switching Frequency | $V_i = 38$ to 60V $I_o = 0$ to 60A | 160 | 180 | 200 | kHz |
| η | Efficiency | $V_i = 38$ to 60V $I_o = 60\text{A}$ | 80 | 81 | | % |
| R_{th} | Thermal Resistance | Case to Ambient | | 5.2 | | $^{\circ}\text{C/W}$ |
| T_{cop} | Operating Case Temperature Range* | | 0 | | +70 | $^{\circ}\text{C}$ |
| T_{stg} | Storage Temperature Range | | -40 | | +105 | $^{\circ}\text{C}$ |

* Thermal intervention @ $T_{cop} = 85^{\circ}\text{C}$

CONNECTION DIAGRAM AND MECHANICAL DATA

Figure 1.



Package U. Dimensions in mm (inches)

PIN DESCRIPTION

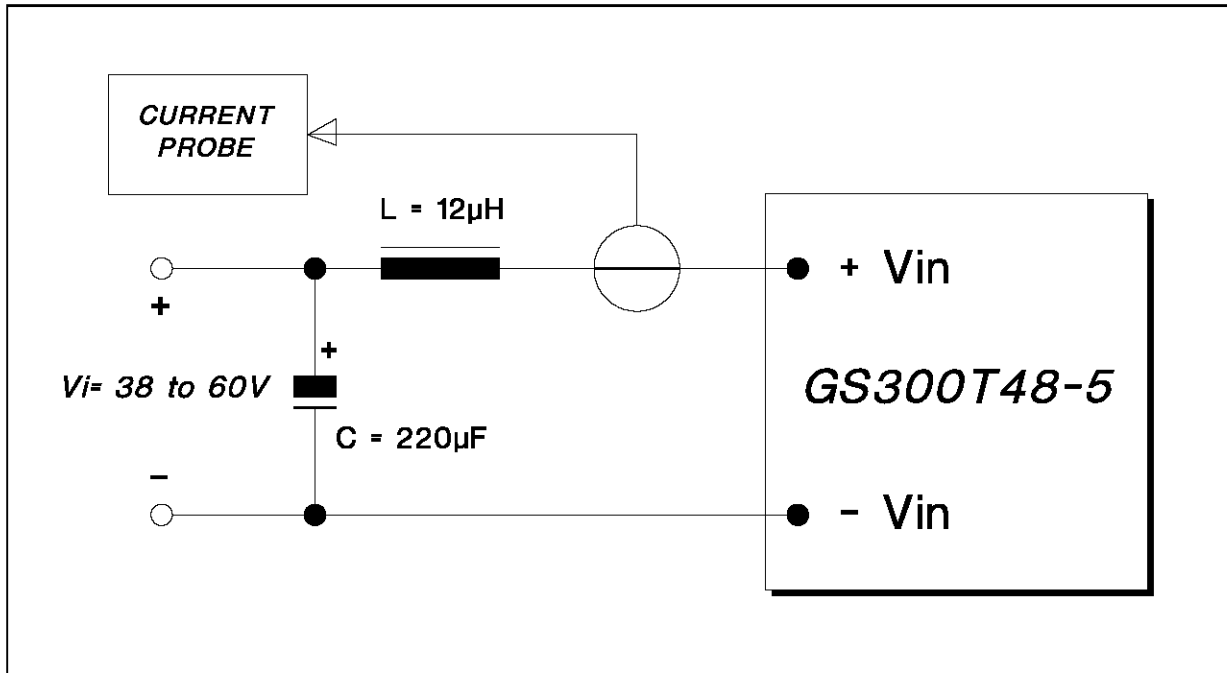
| Pin | Function | Description |
|-------------|----------|---|
| 1,2 | - Vin | Negative input voltage. |
| 3,4 | + Vin | Positive input voltage. Unregulated input voltage (typically 48V) must be applied between pin 1,2-3,4. |
| 5 | SYNC | Synchronization pin. See figures 3, 4, 5, 6. Open when not used. |
| 6 | PARALLEL | Parallel output. See figures 3, 4, 5, 6. Open when not used. |
| 7 | ON/OFF | The converter is ON (Enable) when the voltage applied to this pin with reference to pin 1,2 is lower than 1,2 V (see V _{ien}). The converter is OFF (Inhibit) for a control voltage in the range of 8 to 18V. When the pin is unconnected the converter is OFF (Inhibit). |
| 8 | CASE | Case connection pin |
| 9 | + SENSE | Senses the remote load high side. To be connected to pin 15,16,17 when remote sense is not used. |
| 10 | - SENSE | Senses the remote load return. To be connected to pin 11,12,13,14 when remote sense is not used. In parallel configuration, take care to connect all -SENSE pins together (see figures 3,4,5,6). |
| 11,12,13,14 | - OUT | -5V voltage return. |
| 15,16,17 | + OUT | +5V output voltage. |

USER NOTES

Reflected Input Current

The reflected input current measurement (I_{ir} , see Electrical Characteristics) is performed according to the test set-up of fig. 2.

Figure 2.



Softstart

To avoid heavy inrush current the output voltage rise time is 10ms maximum in any condition of load.

Remote Sensing

The remote voltage sense compensation range is for a total drop of 0.6V equally shared between the load connecting wires.

It is a good practice to shield the sensing wires to avoid oscillations.

See the connection diagram on figures 3, 4, 5, 6.

Remote ON/OFF

The module is controlled by the voltage applied between the ON/OFF pin and -IN pin.

The converter is ON (Enable) when the voltage applied is lower than 1.2 V (see V_{in} on Electrical Characteristics).

The converter is OFF (Inhibit) for a control voltage in the range of 8 to 18V (see V_{inh}).

When the pin is unconnected the converter is OFF. Maximum sinking current is 1mA.

Module Protection

The module is protected against occasional and permanent shortcircuits of the output pins to ground, as well as against output current overload. It uses a current limiting protection circuitry, avoiding latch-up problems with certain type of loads.

A latching crowbar output overvoltage protection is activated when the output voltage exceeds the typical value of 6.3V (see Electrical Characteristics). A thermal non-latching protection disables the module whenever the heatsink temperature reaches about 85°C.

Parallel Operation

To increase available output regulated power, the module features the parallel connection possibility with equal current sharing and maximum deviation of 10% (two modules in parallel).

See the connection diagram on figures 3, 4, 5, 6.

Figure 3.

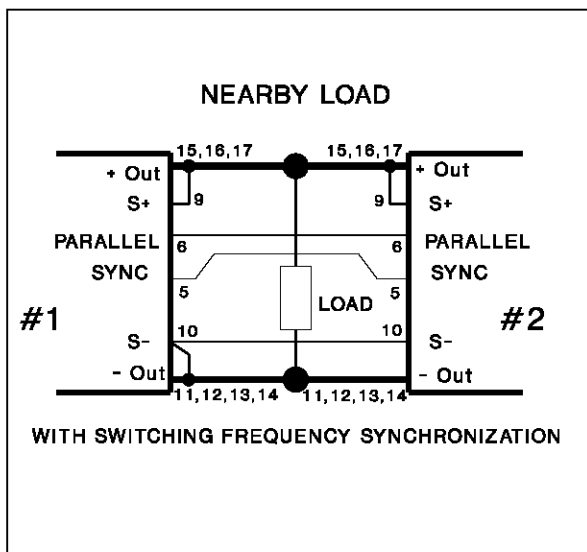


Figure 4.

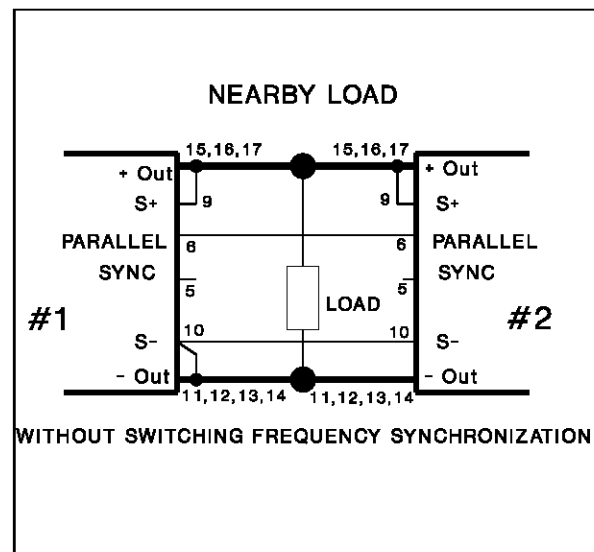


Figure 5.

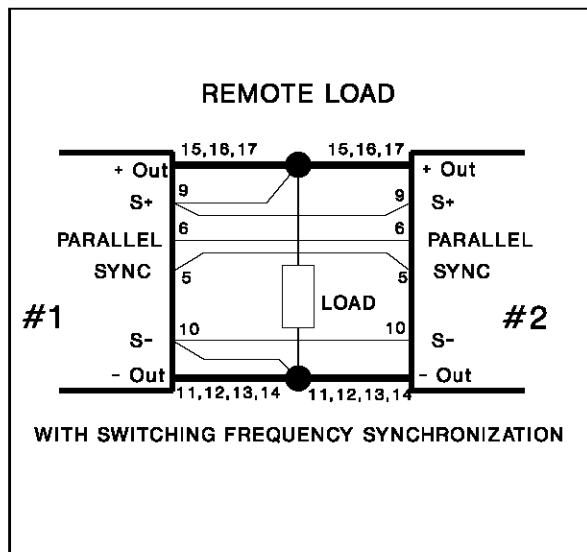
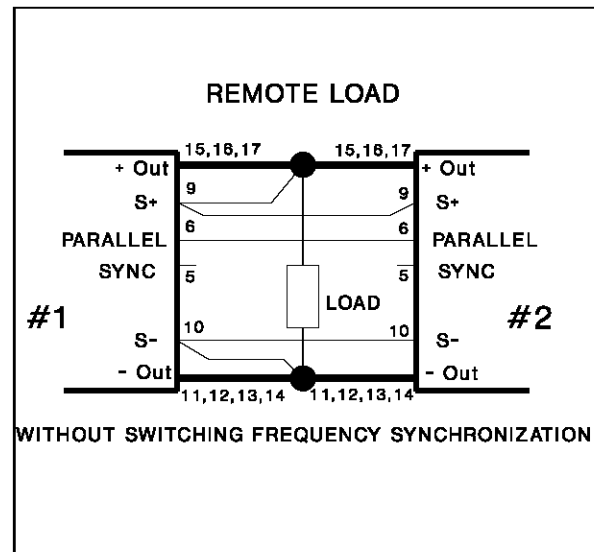


Figure 6.



Thermal Characteristics

The case-to-ambient thermal resistance of the GS300T48-5 module is 5.2°C/W typical. It may be decreased, improving the convection cooling, by mounting an external heatsink to the top of the unit heatsink (fig. 9).

Six threaded holes, # 4-40 UNC on the standard or # M3 on the E version, 5 mm (0,2") maximum deep, are provided for this purpose (see fig. 1).

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