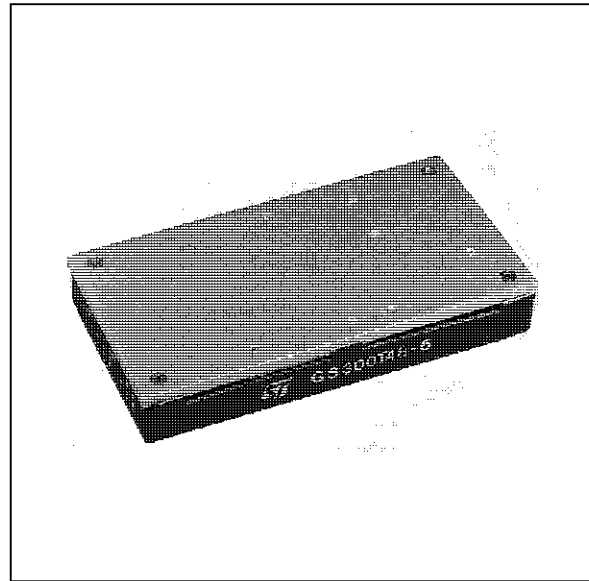


## 300W DC-DC CONVERTER

Type	V <sub>i</sub>	V <sub>o</sub>	I <sub>o</sub>
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<sub>DC</sub> 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).

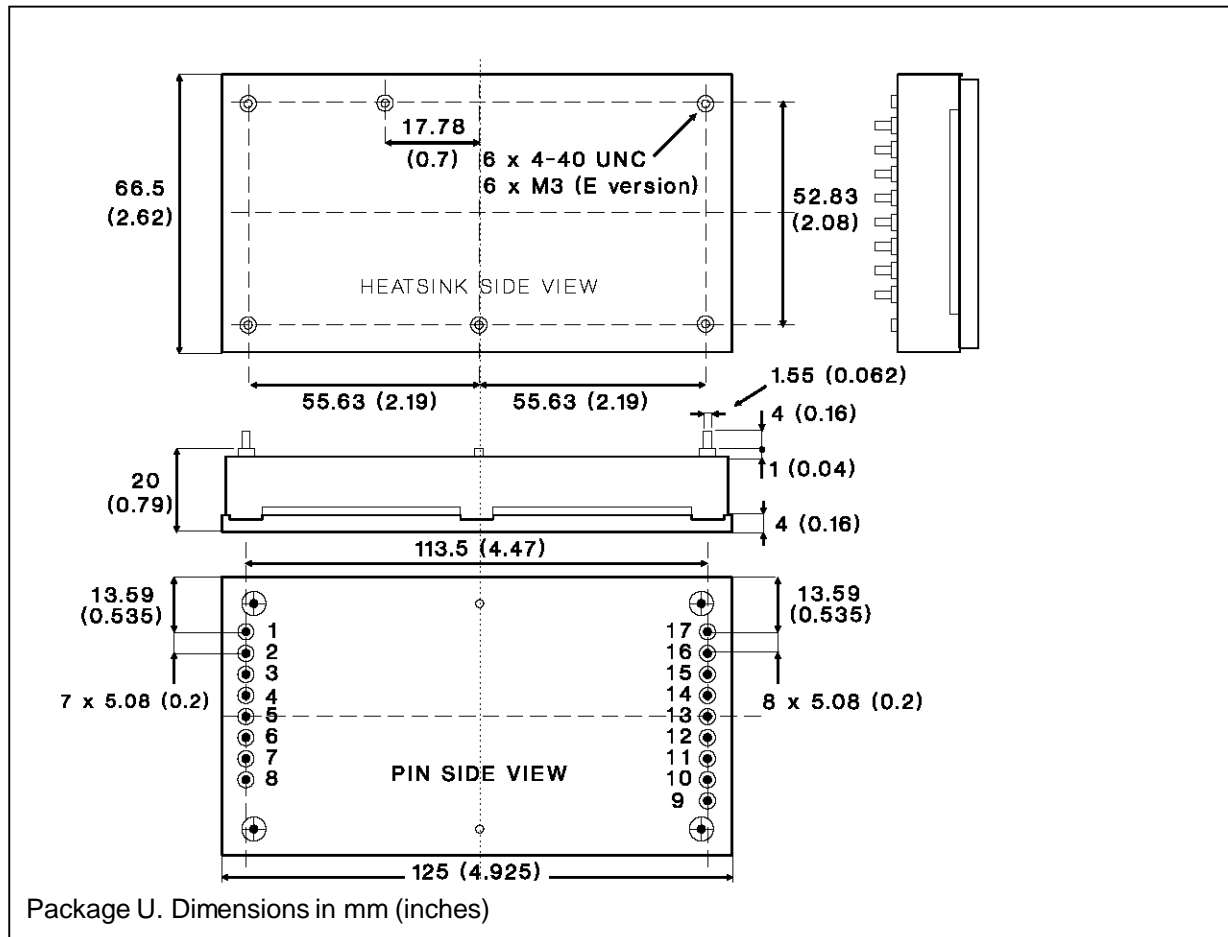
**ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25^{\circ}\text{C}$  unless otherwise specified)

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	$\text{A}^2\text{s}$
$I_{ir}$	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
$\Delta V_o$	Total Remote Sense Compensation	$V_i = 38$ to 60V			0.6	V
$\delta V_o$	Peak Load Transient Response	$V_i = 48\text{V}$ $\delta I_o = 10\text{A}$ slope = 0.1A/ $\mu\text{s}$			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/ $\mu\text{s}$			250	$\mu\text{s}$
$t_{on}$	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
$\eta$	Efficiency	$V_i = 38$ to 60V $I_o = 60\text{A}$	80	81		%
$R_{th}$	Thermal Resistance	Case to Ambient		5.2		$^{\circ}\text{C}/\text{W}$
$T_{cop}$	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

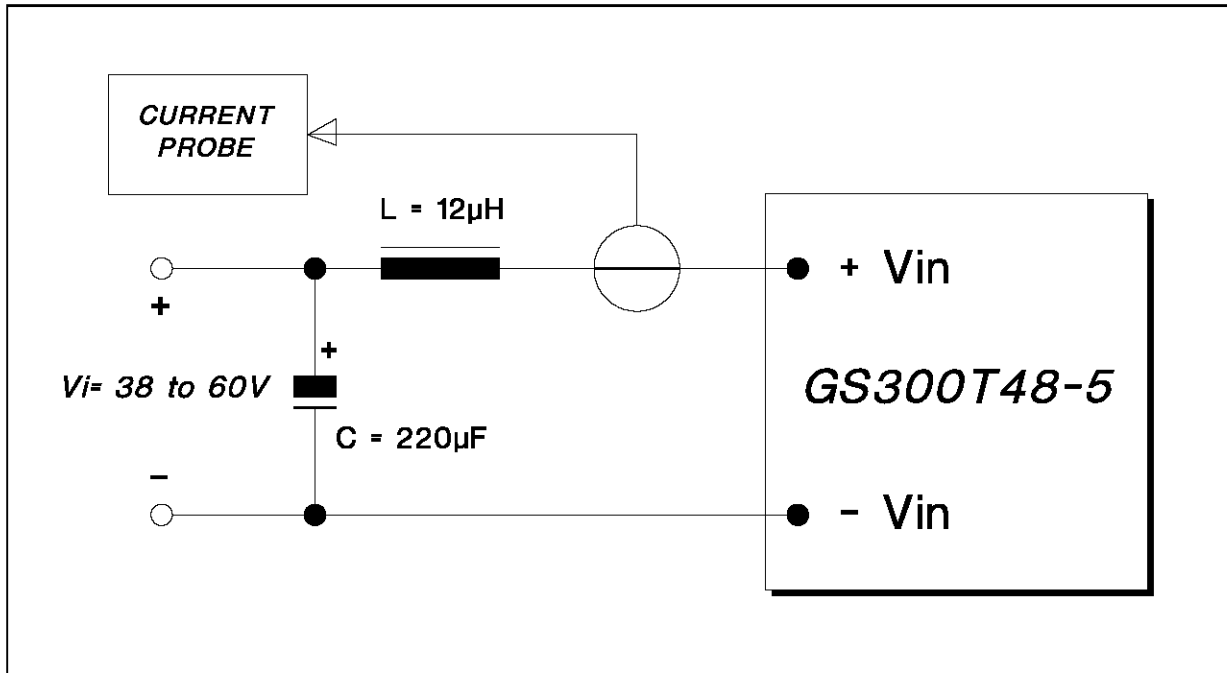
Pin	Function	Description
1,2	- Vin	Negative input voltage.
3,4	+ Vin	Positive input voltage. Unregulated input voltage (typically 48V) must be applied between pin 1,2-3,4.
5	SYNC	Synchronization pin. See figures 3, 4, 5, 6. Open when not used.
6	PARALLEL	Parallel output. See figures 3, 4, 5, 6. Open 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 <sub>ien</sub> ). 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.

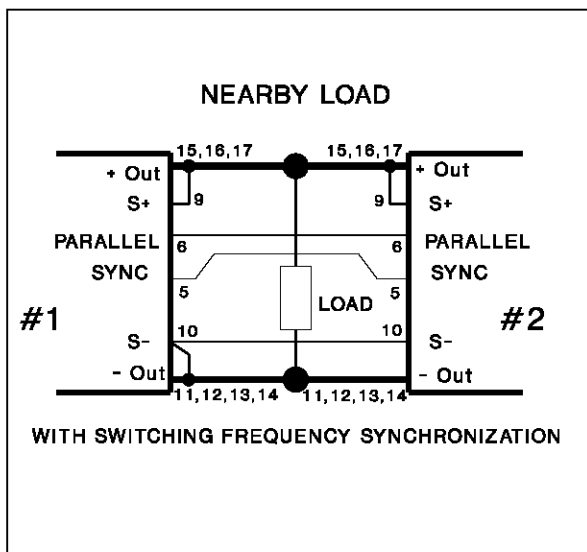


Figure 4.

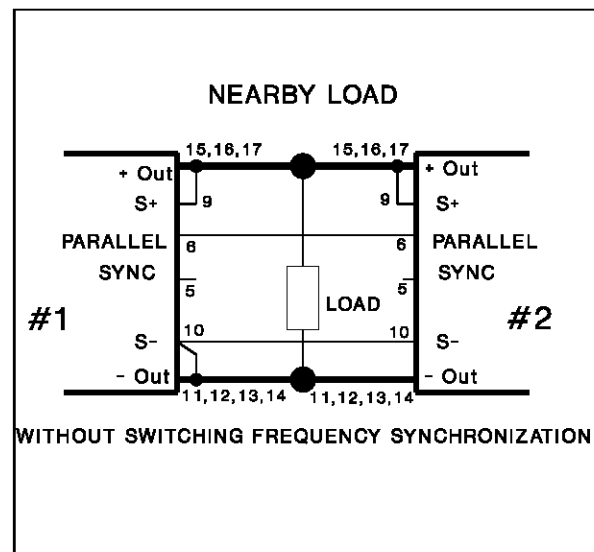


Figure 5.

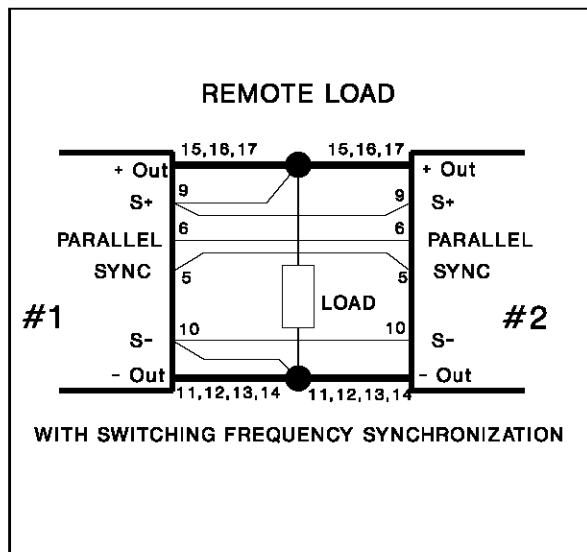
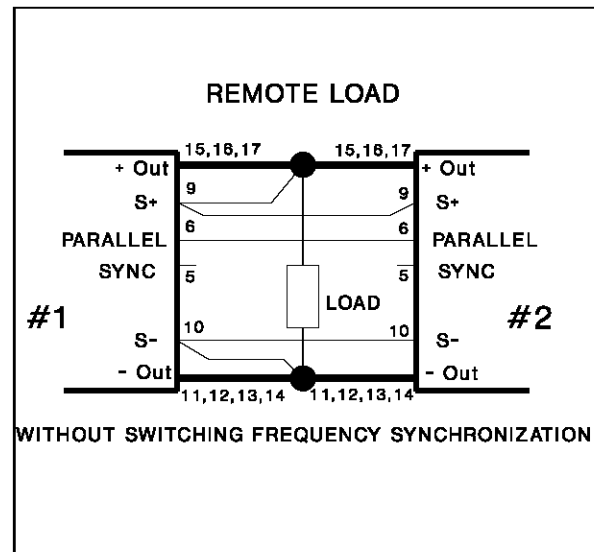


Figure 6.



### 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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