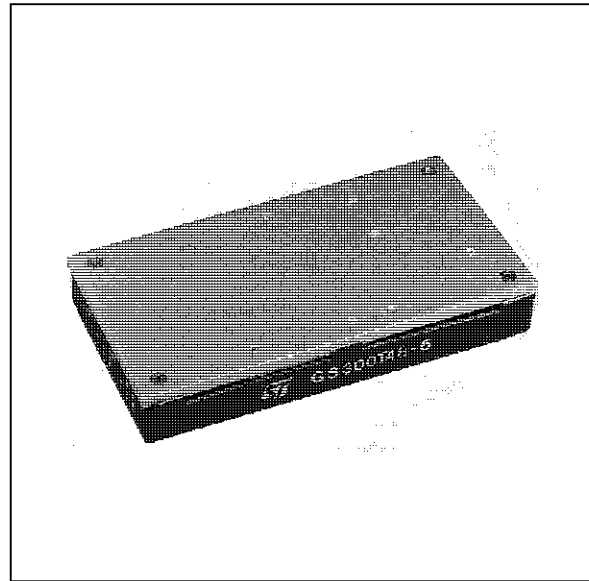


300W DC-DC CONVERTER

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).

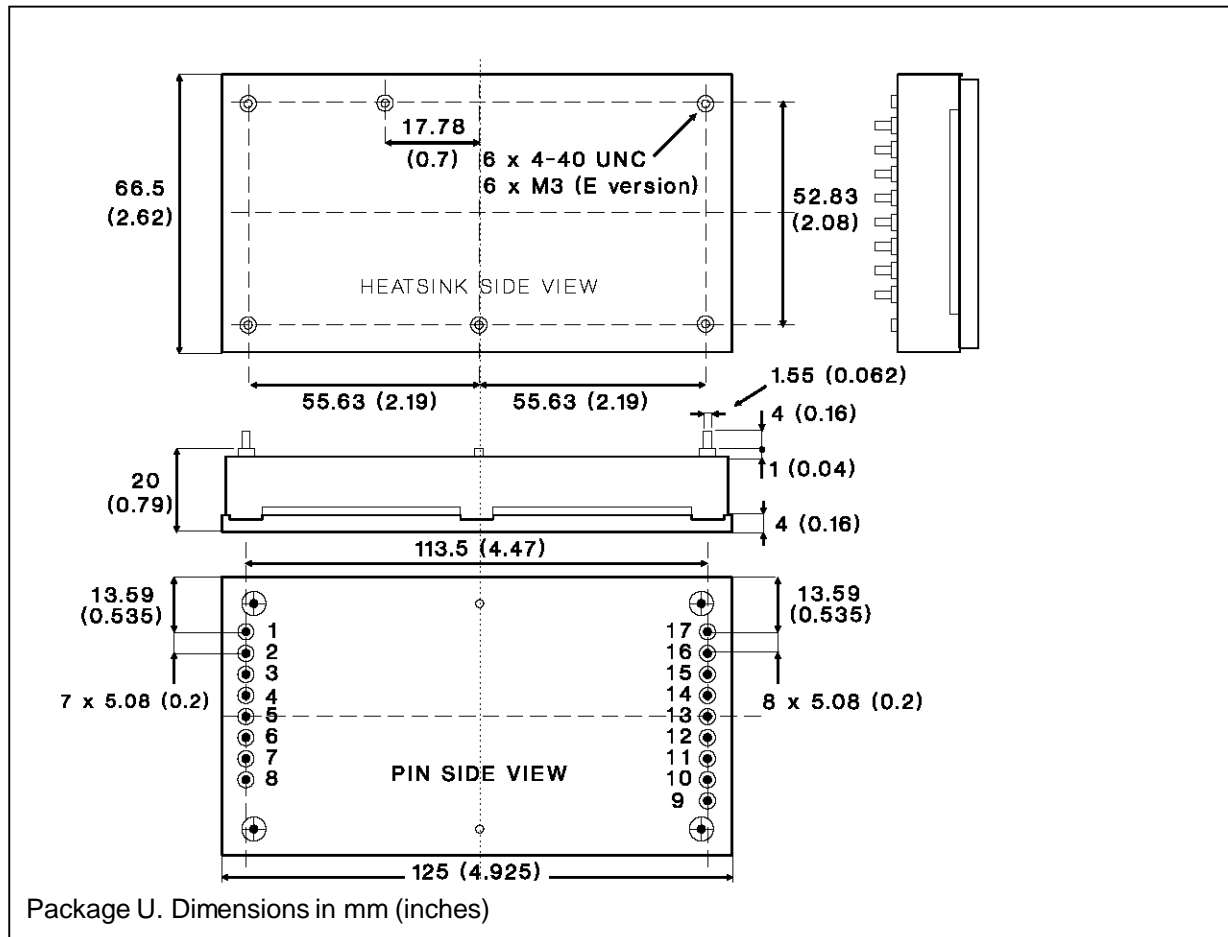
ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified)

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		$^{\circ}\text{C}/\text{W}$
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

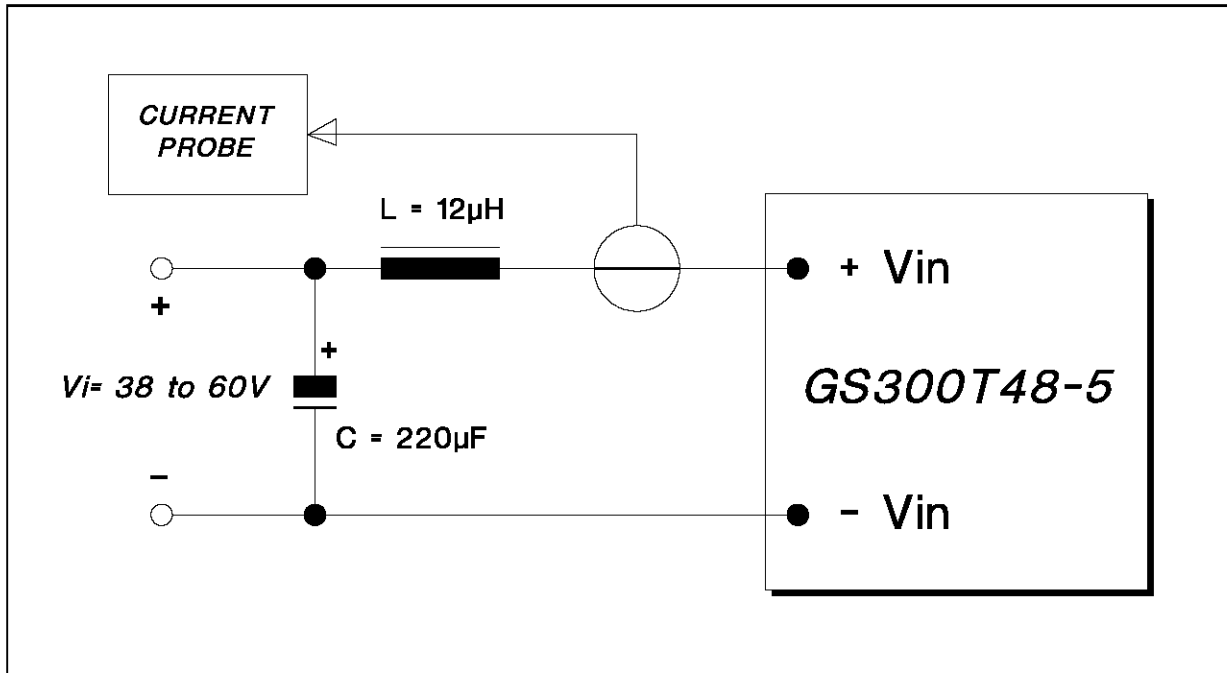
Pin	Function	Description
1,2	- Vin	Negative input voltage.
3,4	+ Vin	Positive input voltage. Unregulated input voltage (typically 48V) must be applied between pin 1,2-3,4.
5	SYNC	Synchronization pin. See figures 3, 4, 5, 6. Open when not used.
6	PARALLEL	Parallel output. See figures 3, 4, 5, 6. Open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

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

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.

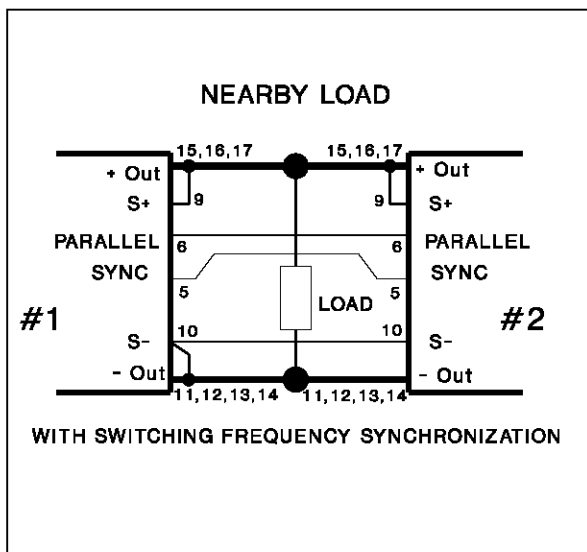


Figure 4.

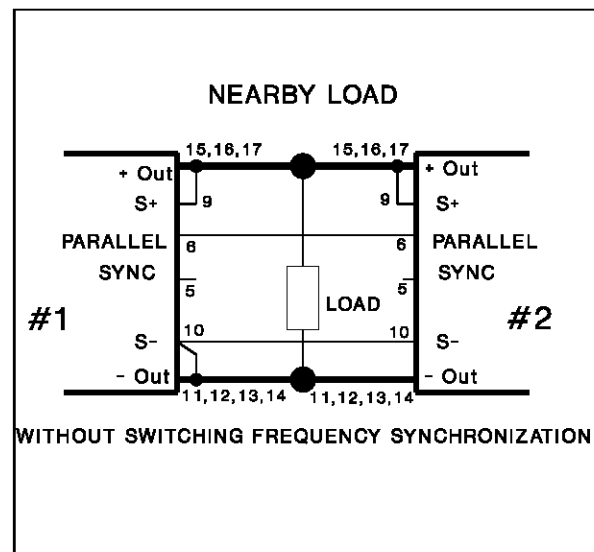


Figure 5.

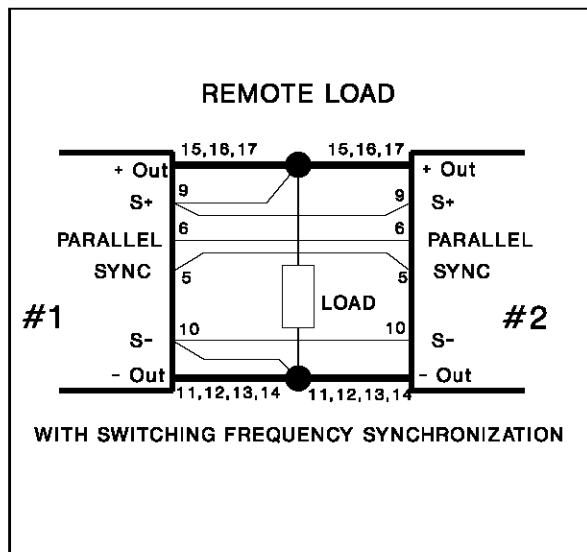
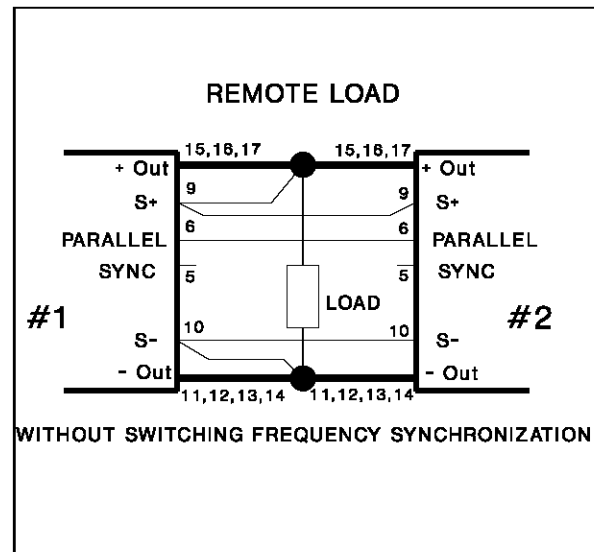


Figure 6.



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).

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics – All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES
Australia - Brazil - China - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.