

25/30 W DC-DC CONVERTER FAMILY

Type	V _{in}	V _{out}	I _{out}
GS25T24-5	18 to 36 V	5 V	5 A
GS30T24-12	18 to 36 V	12 V	2,5 A
GS30T24-15	18 to 36 V	15 V	2 A

FEATURES

- MTBF in excess of 1M hours at +45°C ambient temperature
- Wide input voltage range (18 to 36V)
- No external component required
- High efficiency (see data)
- Non latching permanent short-circuit protection
- Overvoltage protection
- Redundant operation
- Remote output voltage sense
- Remote INHIBIT/ENABLE
- Soft-start
- Minimized reflected input current
- Reverse input polarity protection
- Peak input overvoltage withstand
- No derating over the temperature range
- 500V_{DC} minimum isolation between input and output
- PCB or chassis mountable



DESCRIPTION

The GS25T24-5, GS30T24-12 and GS30T24-15 are isolated DC-DC converters designed for general purpose application.

The output power is in the range of 25W to 30W. To ensure very long life, these converters do not use electrolytic aluminum capacitors or optoelectronic feedback systems.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _i	DC Input Voltage	17 to 38V	V
V _{ipk}	Input Transient Overvoltage (t ≤ 1sec.)	45	V
V _{ir}	Input Reverse Voltage	50	V
T _{stg}	Storage Temperature Range	-55 to +105	°C
T _{op}	Operating Temperature Range	-25 to +71	°C

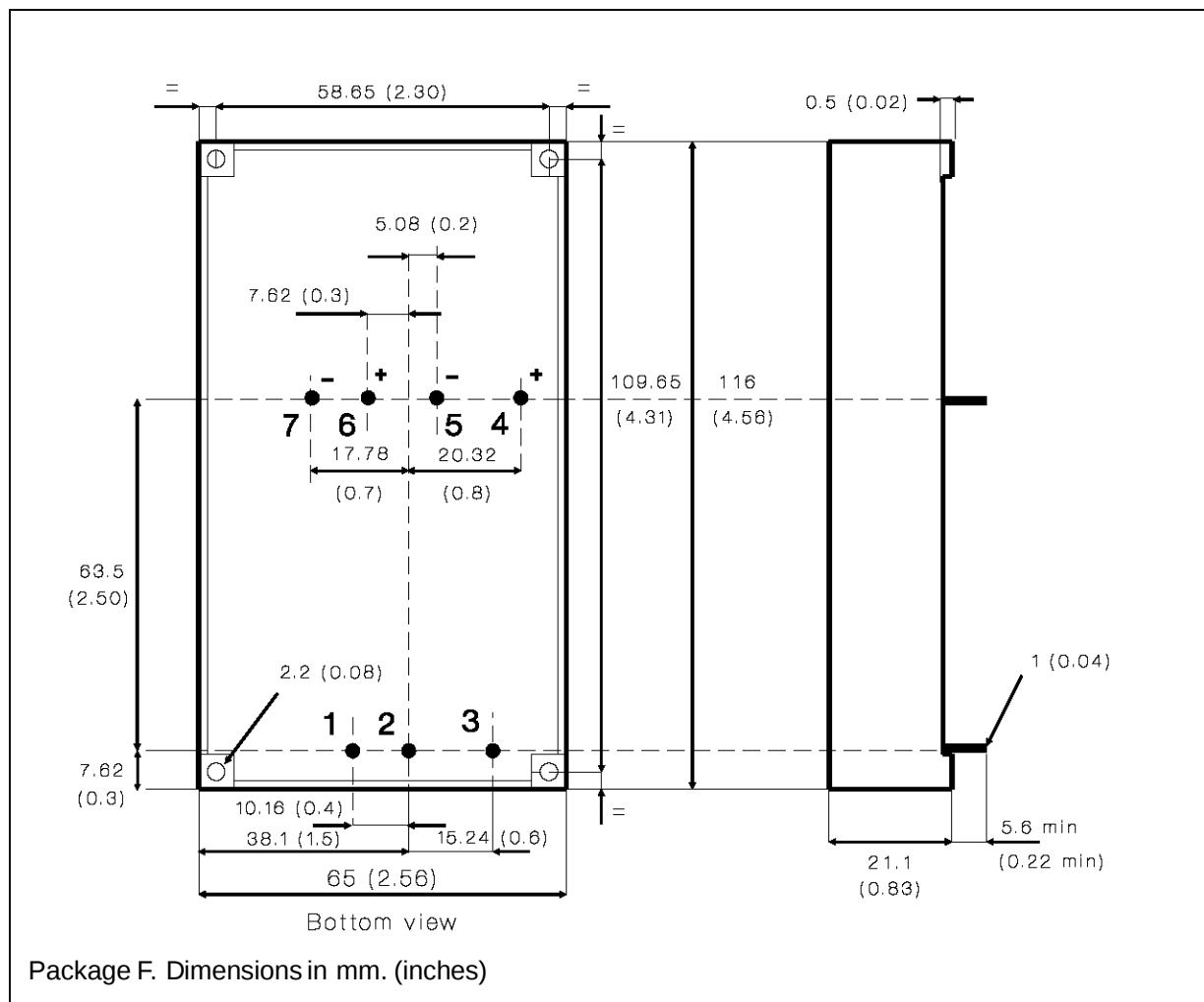
GS25/30T24 FAMILY

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_i	Input Voltage	Full Load	18	24	36	V
I_i	Input Current	GS25T24-5 Full Load		1370		mA
		GS30T24-12 GS30T24-15 Full Load		1600		
I_{ir}	Input Reflected Current	$V_i = 24\text{V}$ Full Load		40		mApp
I_{isc}	Input Short-circuit Current	GS25T24-5 $V_i = 24\text{V}$		360		mA
		GS30T24-12 $V_i = 24\text{V}$		220		
		GS30T24-15 $V_i = 24\text{V}$		200		
I_{iq}	Input Quiescent Current	$V_i = 24\text{V}$ Converter OFF		5		mA
V_{inhl}	Low Inhibit Voltage	$V_i = 24\text{V}$ Full Load			1.2	V
V_{inhh}	High Inhibit Voltage	$V_i = 24\text{V}$ Full Load	1.8 (open)			V
I_{inh}	Input Inhibit Current	$V_i = 24\text{V}$ Full Load		1		mA
V_o	Output Voltage	GS25T24-5 $V_i = 24\text{V}$ Full Load	4.95	5.00	5.05	V
		GS30T24-12 $V_i = 24\text{V}$ Full Load	11.88	12.00	12.12	
		GS30T24-15 $V_i = 24\text{V}$ Full Load	14.85	15.00	15.15	
V_{or}	Output Ripple and Noise Voltage	$V_i = 24\text{V}$ Full Load		10		mVpp
δV_o	Line Regulation	$V_i = 18$ to 36V Full Load		± 0.001		%
δV_o	Load Regulation	$V_i = 24\text{V}$ Full Load to No Load		± 0.05		%
V_{oov}	Output Overvoltage Protection	GS25T24-5 $V_i = 24\text{V}$ Full Load			6.8	V
		GS30T24-12 $V_i = 24\text{V}$ Full Load			15	
		GS30T24-15 $V_i = 24\text{V}$ Full Load			18	
δV_o	Remote Sense per Leg	$V_i = 18\text{V}$			0.5	V
T_c	Temperature Coefficient	$V_i = 24\text{V}$ Full Load Operating Temperature Range			+0.02	%/ $^{\circ}\text{C}$

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
I_o	Output Current	GS25T24-5 $V_i = 18$ to 36V	0		5	A
		GS30T24-12 $V_i = 18$ to 36V	0		2.5	
		GS30T24-15 $V_i = 18$ to 36V	0		2	
I_{osck}	Output Current Limit	GS25T24-5 $V_i = 24\text{V}$ Overload			5.5	A
		GS30T24-12 $V_i = 24\text{V}$ Overload			2.75	
		GS30T24-15 $V_i = 24\text{V}$ Overload			2.2	
t_{ss}	Soft-start Time	$V_i = 24\text{V}$ Full Load		30		ms
t_{rt}	Transient Recovery Time	$V_i = 24\text{V}$ Step Load Change $\Delta I_o = 25\%$		75		μs
V_{is}	Isolation Voltage		500			Vdc
f_s	Switching Frequency			150		kHz
η	Efficiency	GS25T24-5 $V_i = 24\text{V}$ Full Load	75	78		%
		GS30T24-12 $V_i = 24\text{V}$ Full Load	79	82		
		GS30T24-15 $V_i = 24\text{V}$ Full Load	80	83		
R_{is}	Isolation Resistance		10^9			Ω
R_{thc}	Thermal Resistance Case to Ambient			4		$^{\circ}\text{C/W}$

CONNECTION DIAGRAM AND MECHANICAL DATA

PIN DESCRIPTION

Pin	Function	Description
1	- IN	Negative input voltage.
2	+ IN	Positive input voltage. Unregulated input voltage (typically 24V) must be applied between pin 1-2. The input section of the DC-DC converter is protected against reverse polarity by a series diode. No external fuse is required. Input is filtered by a Pi network.
3	ON/OFF	Logically compatible with CMOS or open collector TTL. The converter is ON (Enable) when the voltage applied to this pin with reference to pin 1 is higher than 1.8V. The converter is OFF (Inhibit) for a control voltage lower than 1.2V. When the pin is unconnected the converter is ON (Enable).
4	+ SENSE	Senses the remote load high side. To be connected to pin 6 when remote sense is not used.
5	- SENSE	Senses the remote load return. To be connected to pin 7 when remote sense is not used.
6	+ OUT	Output voltage.
7	- OUT	Output voltage return.

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 - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.