SGS-THOMSON MICROELECTRONICS

GS25/30T24 Family

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 ($t \leq 1$sec.)	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

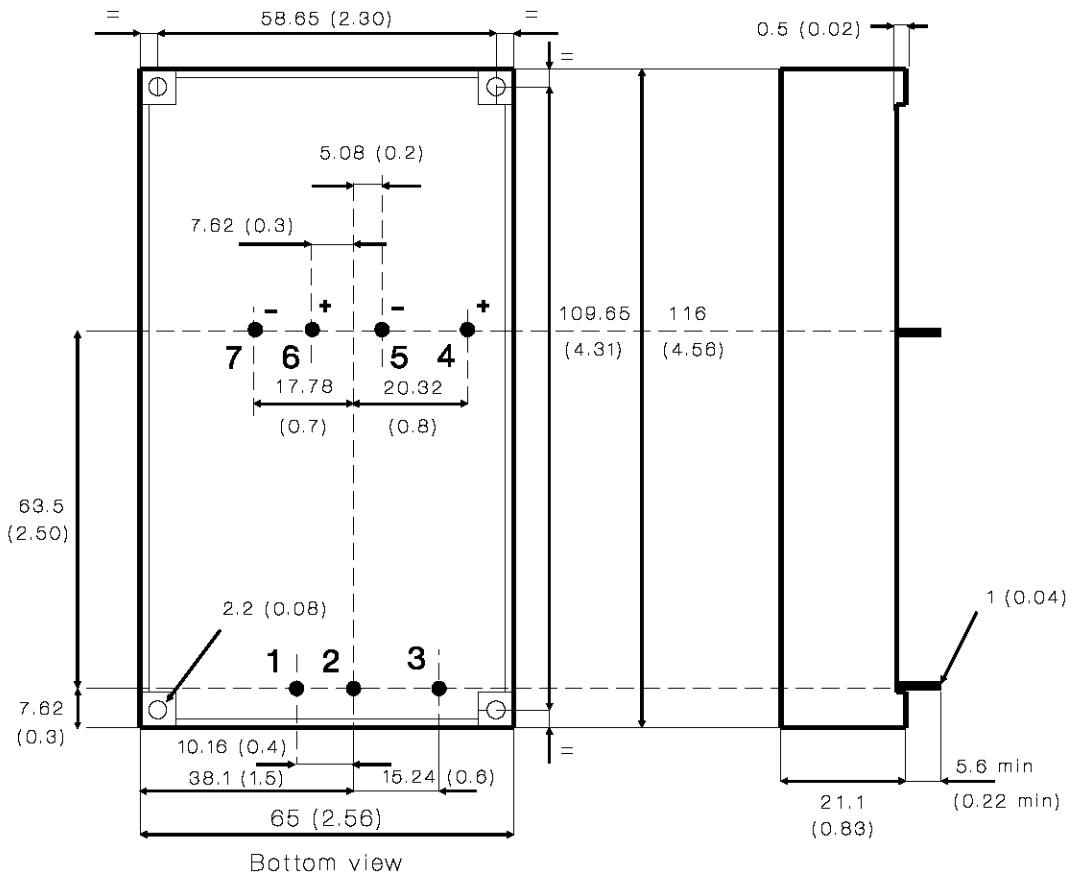
ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C unless otherwise specified)

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

ELECTRICAL CHARACTERISTICS (T_{amb} = 25°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 = 24V Overload			5.5	A
		GS30T24-12 V_i = 24V Overload			2.75	
		GS30T24-15 V_i = 24V Overload			2.2	
t_{ss}	Soft-start Time	V_i = 24V Full Load		30		ms
t_{rt}	Transient Recovery Time	V_i = 24V Step Load Change δI_o = 25%		75		µs
V_{is}	Isolation Voltage		500			Vdc
f_S	Switching Frequency			150		kHz
η	Efficiency	GS25T24-5 V_i = 24V Full Load	75	78		%
		GS30T24-12 V_i = 24V Full Load	79	82		
		GS30T24-15 V_i = 24V Full Load	80	83		
R_{is}	Isolation Resistance		10^9			Ω
R_{thc}	Thermal Resistance Case to Ambient			4		°C/W

CONNECTION DIAGRAM AND MECHANICAL DATA



Package F. Dimensions in mm. (inches)

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.