G-ENERGY

DC Converter Specification

GEMSDS4813840

Input voltage	Output voltage	Output current	Output power	Efficiency	Size
30-90V	13.8V	40A	552W	96.3%	100x80x39mm

The GEMSDS4813840 is a Non-isolated DC-DC converter that uses a synchronous rectification technology, and features high efficiency and power density. It has the dimensions of 100x80x39mm and provides the rated output voltage of 13.8V and the maximum output current of 40A.

Features

- Design meeting RoHS / CE
- High efficiency:96.3%(@48Vin
- Import capacitors, high reliability
- Output transient absorption protection
- Support -40 °C environment
- 100% full load burn-in test
- 3 month warranty
- Remote ON/OFF control (optional)
- Waterproof level IP67
- Undervoltage, short circuit, overload protection

Applications

- Industrial
- Alternative Energy
- Golf Cart
- Forklift
- Electromotor
- Telecommunications Boat & Yatch
- Medical
- Led Marketplace & So On

Model naming method

GEMSDS4813840

GE : G-energy
M : Metal Body
SD : Step Down
S : Screw Terminal Connection
48 : 48V Input Voltage
138: 13.8V Output Voltage
40 : 40A Max Current

Electrical Specifications

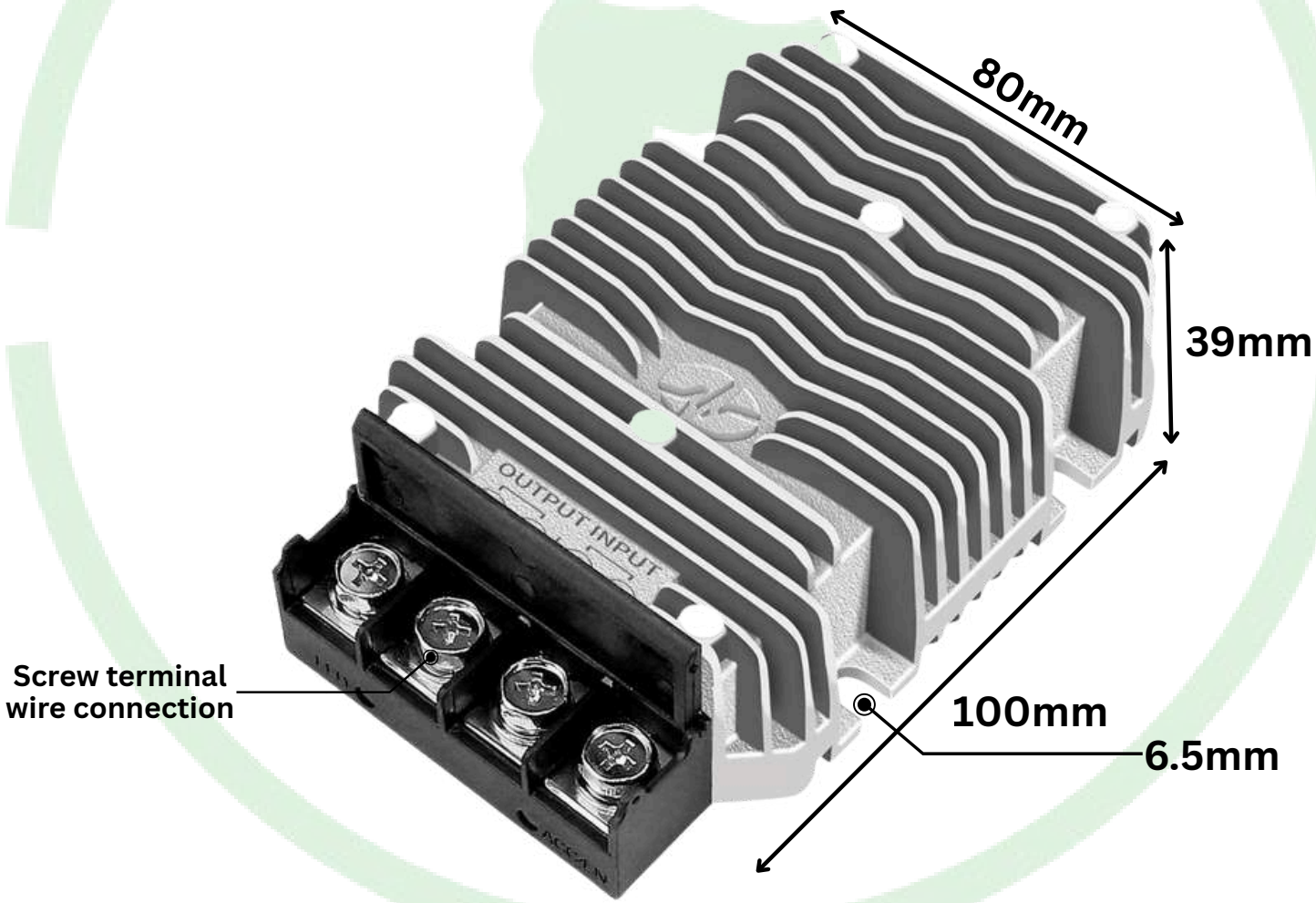
Conditions:TA=25°C(77°F),Airflow= 1 m/s (200LFM), Vin =48V Vout =13.8V, unless otherwise specified

Parameter	Min.	Typ	Max.	Units	Remarks
Absolute maximum ratings					
Operating ambient temperature	-40	-	+50	°C	
Shell ambient temperature	-40	-	80	°C	
Storage temperature	-55	-	100	°C	
Operating humidity	5	-	95	%	Non-condensing
Atmospheric pressure	62	-	106	Kpa	
Altitude	-	-	4000	m	
Cooling way	-	-	-		Natural cooling

Input characteristics

Input voltage	30	48/72	90	V	-
Max. input voltage	-	-	90	V	Continuous
Undervoltage shutdown	26.3	26.5	26.8	V	Automatic recovery
Undervoltage recovery	27.4	27.5	27.7	V	Automatic recovery
Max. input current	-	-	20	A	Vin =30V; Iout =40A
No load current	-	137	150	mA	Vin = 12V

Positive electrode cable	12	-	-	AWG	If the wire length is greater than 50cm, it is recommended to use a thicker wire diameter.
Negative electrode cable	12	-	-	AWG	
Enable PIN cable	-	NA	-	AWG	If the product has this feature
Fuse	-	30	-	A	Input positive has built in fuse



Output characteristics

Efficiency	-	96.3	-	%	Vin =48V; Iout =40A
Output voltage	13.6	13.8	13.9	V	Vin =48V; Iout =40A
Regulator accuracy	-	±2	-	%	
Voltage regulation	-	±2	-	%	
Load Regulation	-	±2	-	%	
Overvoltage protection	-	NA	-	V	
Output current	0	-	40	A	
Overcurrent protection	42	48	55	A	Vin=48V
External capacitance	-	NA	-	μF	
Output ripple and noise	-	132	250	mVp-p	Vin =30-60V; Iout=40A, Oscilloscope bandwidth: 20 MHz
Output voltage rise time	-	75	100	mS	
Boot delay time	-	87	200	mS	
Out voltage overshoot	-	1	2	%	Vin =48V, 50%-75% Load step
Over temperature protection	-	-	90	°C	
Short circuit protection	-	Yes	-		output cant shorted for boost converter
Positive electrode cable	10	-	-	AWG	If the wire length is greater than 50cm, it is recommended to use a thicker wire diameter.
Negative electrode cable	10	-	-	AWG	

Feature Description

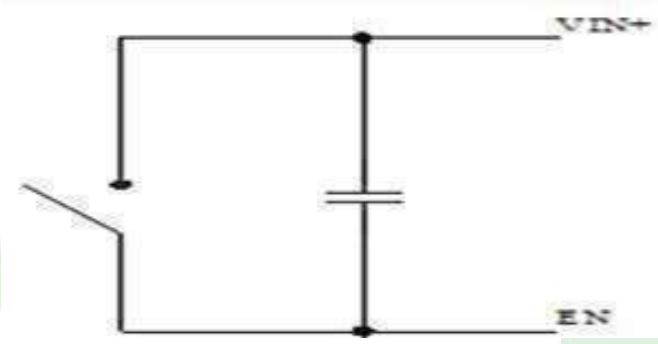
Remote On/Off (EN) (Optional)

Logic Enable	Low level (0-30Vdc)	High level (30-60Vdc)	Left open
Positive logic	Off	On	Off

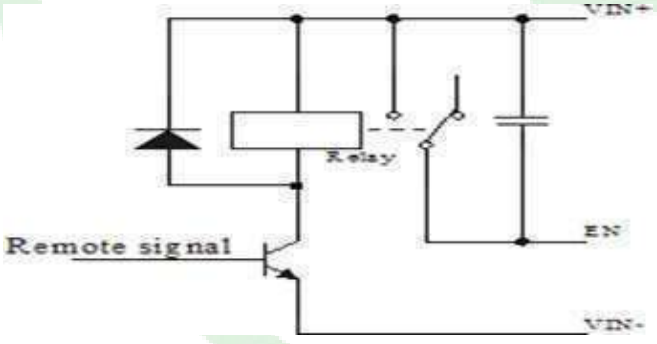
Input Undervoltage Protection

Theconverter will shutdownaftertheinput voltage drops below the under-voltage protection threshold for shutdown. The converter will start to work again after the input voltage reaches the input under voltage protection threshold for startup. For the Hysteresis, see

Various circuits for driving the EN



Simple control



Transistor control

Output Overcurrent Protection

The converter equipped with current limiting circuitry can provide protection from an output overload or short circuit condition . If the output current exceeds the output overcurrent protection set point, the converter enters hiccup mode. When the fault condition is removed, the converter will automatically restart.

Wiring Instructions

The input and output of this product is terminals. The user should ensure that the input and output wires and terminals are connected reliably, and pay attention to the wire diameter to meet the requirements of the power supply current. If the cable to be used is long, it needs Considering the voltage drop of the wire, if the voltage drop is too large, the voltage output at the load end may not meet the load demand. In this case, consider using a thicker wire diameter or reducing the length of the wire. Generally, if long wiring is required. Long line should be used on the side where the current is relatively small. For example, this product is a step-down product, so long lines should be used on the input side.

Safety and EMC features

Anti-electric Strength	Input to Output		V	Leakage current ≤ 3.5mA, 1min, no breakdown, no arcing
	Input to Shell	≥500	V	
	Output to Shell	≥500	V	
Insulation resistance	Input to Output	≥10	MΩ	Test voltage = 500V
	Input to Shell			
	Output to Shell			

Other characteristics

Weight	≤ 570	g	
Package	White box		
MTBF	≥200,000	H	Vin= 48V; Iout= 40A
Switching frequency	100±10	KHz	

Characteristic Curves

Conditions:TA=25°C(77°F),Vin = 48V Vout = 13.8V, unless otherwise specified

Figure 1, Efficiency

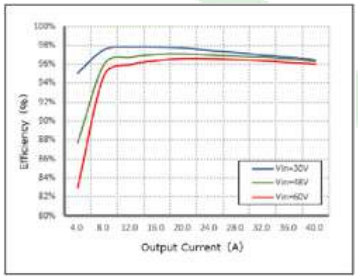


Figure 2, Power dissipation

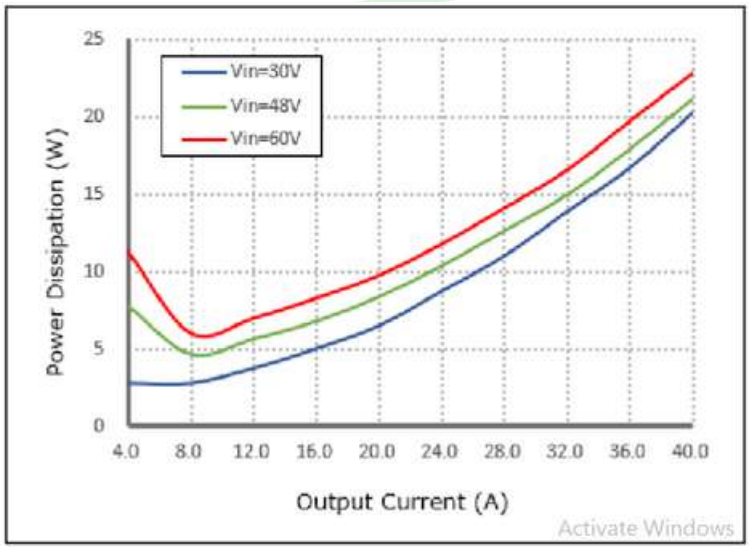
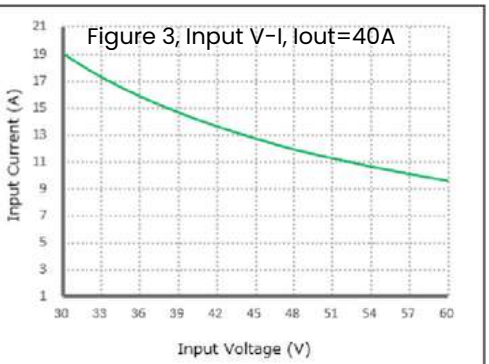


Figure 3, Input V-I, Iout=40A



Typical Waveforms

Conditions: TA = 25°C (77°F), Vin = 48V, unless otherwise specified.

Figure 4, 25% - 50% load dynamic

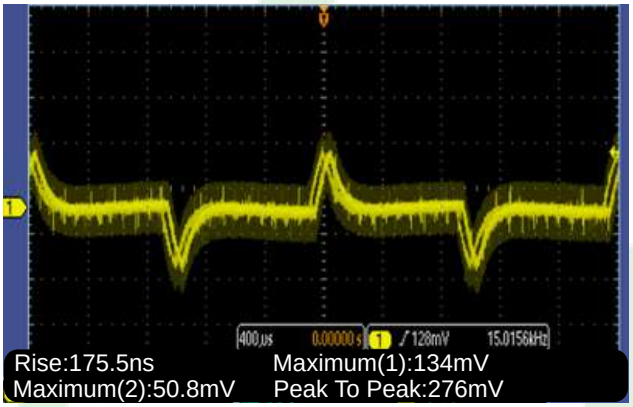


Figure 5, 50% - 75% load dynamic

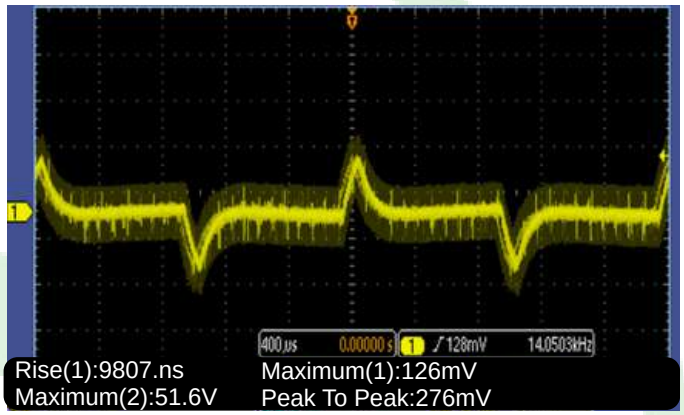


Figure 6, Output voltage established (Iout = 40A)

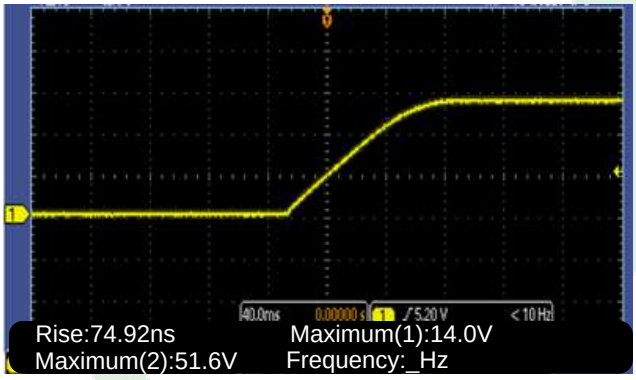
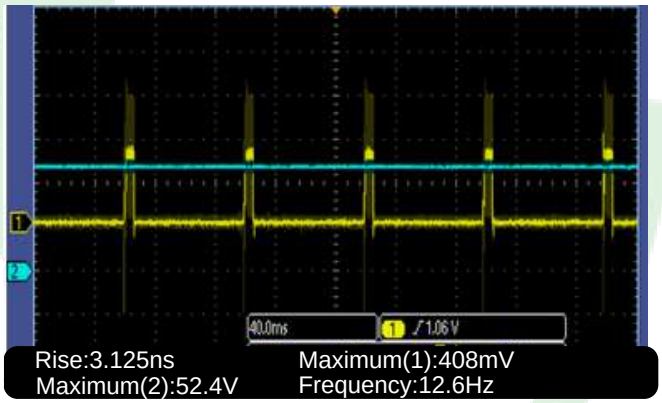


Figure 7, Output ripple & noise (Iout = 40A)



Thermal Consideration

Sufficient airflow should be provided to help ensure reliable operating of the GEMISD4813840 Therefore, thermal components are mounted on the top surface of the GEMISD4813840 to dissipate heat to the surrounding environment by conduction, convection, and radiation. Proper airflow can be verified by measuring the temperature at the middle of the base plate.