

RPM-450

450W 9-32V to 13.8V Buck-Boost Voltage Regulator Module for DC Systems



Key Features

- 9–32V DC input with regulated 13.8V output, up to 450W
- 94–96% conversion efficiency
- Rugged, -25°C to 70°C fanless operation
- Comprehensive protections: OVP, UVP, OCP, SCP and RPP
- Real-time monitoring DCIN and ultra-precise control of DCOUT by MCU
- EN55032 & EN55035 class A

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Introduction

The Neosys RPM-450 is a rugged buck-boost DC-DC converter that delivers a stable 13.8 V / 450 W output across a wide 9–32 V input range. Designed for 12 V / 24 V in-vehicle power systems and industrial applications, it smooths voltage fluctuations to ensure uninterrupted operation of high-power electronics. Even when input voltage drops to 9 V, the RPM-450 sustains a steady 13.8 V output, keeping back-end devices such as GPU computers running reliably without resets or power dropouts.

Built for harsh environments, the RPM-450 operates fanlessly from -25 °C to +70 °C. Its compact form factor fits tight spaces, shortens cable runs, and reduces integration costs, while 94–96% efficiency minimizes self-heating and simplifies thermal management.

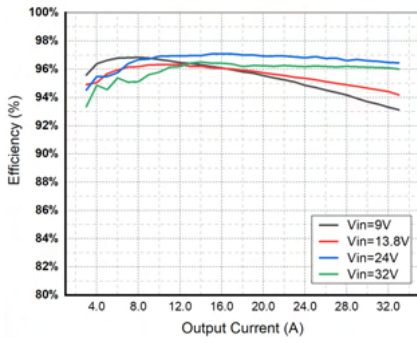
The RPM-450 also features millisecond-level Undervoltage/Overvoltage Protection (UVP/OVP) with automatic recovery to safeguard back-end systems against unexpected voltage fluctuations. In addition, hardware Overcurrent/Short-Circuit Protection (OCP/SCP) prevents damage from overloads, and reverse-polarity protection guards against wiring errors. Front-panel LED indicators provide instant input/output status for quick diagnostics and reduced downtime.

Stable power is the foundation of edge AI applications. The Neosys RPM-450 provides a reliable 13.8 V backbone for GPU computer systems—delivering consistent performance under variable input, reducing unexpected reboots, and extending system uptime.

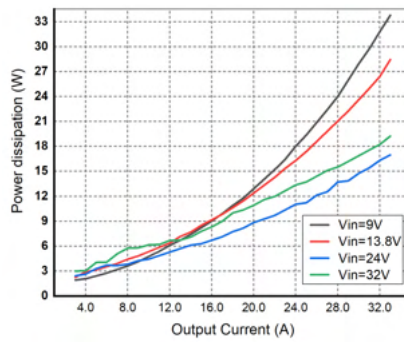
Specifications

Input Characteristics		Protection	
Input voltage	9V to 32V	UVP	OFF ≤ 8.5 V, ON ≥ 8.9 V; auto-recovery
Undervoltage shutdown	8.5V	OVP	OFF ≥ 34 V, ON ≤ 32.3 V; auto-recovery
Undervoltage recovery	8.9V, Automatic recovery	OCP	Trips at 47 A; power-cycle to restore output
Overvoltage shutdown	34V	SCP	Survives 2 h short-circuit; power-cycle to restore output
Overvoltage recovery	32.3V, Automatic recovery	RPP	Reverse-input protected up to 38 V without damage
Input current	Max. 50A, per pin 25A	Mechanical	
No load current	156mA	Dimension	95 mm (W) x 144.1 mm (D) x 41.2 mm (H)
Output Characteristics (Vin=13.8V; Iout=33A, RT=25°C)		Weight	0.8 kg
Efficiency	94%	Mounting	Wall-mount (standard) DIN-rail mount (optional)
Output voltage	13.8V	Positive/Negative electrode cable (input/output)	Use O- or Y-type rings; outer Ø ≤ 8.2 mm inner Ø ≥ M3.5 screw
Output current	0 ~ 33A	Environmental and Safety	
Rated Power	450W	EMC	CE/FCC Class A, according to EN 55032 & EN 55035
Over Current Protection	47A	Operating Temperature	-25°C ~ 70°C
Output ripple and noise	120mV	Storage Temperature	-40°C ~ 85°C
Output voltage rise time	3.38ms	Humidity	5%~90% , non-condensing
Boot delay time	216ms	Switching Frequency	350KHz
Voltage regulation	±1%		
Load regulation	±1%		

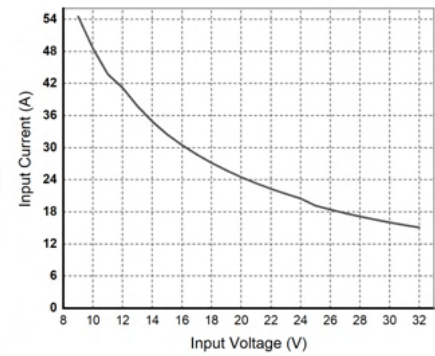
Characteristic Curves



Efficiency

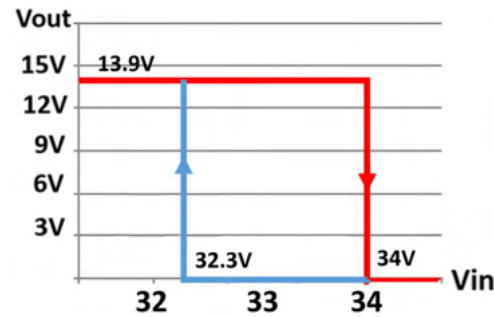
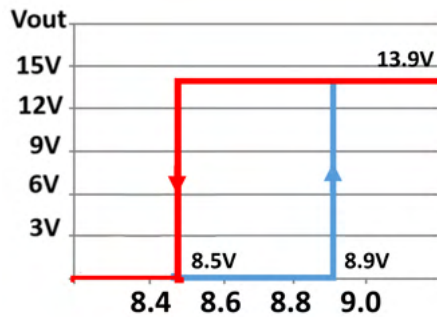


Power dissipation



VI curve (VIN=13.8V, IOUT=33A)

Feature Description

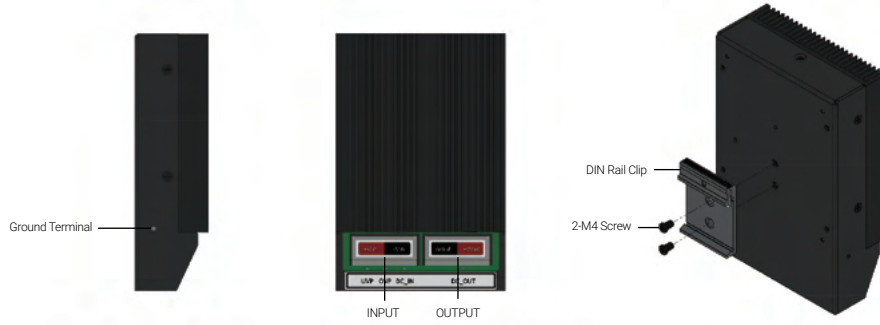


Input Undervoltage / Overvoltage Protection (UVP / OVP)

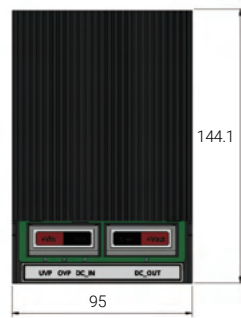
RPM-450 shuts down when the input voltage falls below 8.5 V or rises above 34 V, preventing erratic start-ups and component stress. It recovers automatically when the input voltage rises to 8.9 V (UVP) or drops back to 32.3 V (OVP), eliminating the need for a manual reset.

Overcurrent & Short-Circuit	RPM-450 features OCP that limits output when the load exceeds 125% of the rated output power. It also provides SCP: under a hard short, the unit enters hiccup mode and withstands a continuous short for more than two hours without damage. Output is restored after the fault is cleared and input power is cycled.
Reverse-Polarity Protection (RPP)	An internal protection block safeguards the module against accidental reverse connection up to -38 V, preventing damage to both the converter and the system harness.
Millisecond-Level DC-IN Detection and Real-Time Status Indication	An onboard MCU continuously monitors the DC-IN and responds with millisecond-level detection speed, providing real-time protection status. Front-panel LEDs offer clear and intuitive visual indicators—"DC-IN Sensed," "UV/OV Alert," and "Regulator Output ON"—allowing technicians to quickly verify system power conditions at a glance.
Wiring Instructions (voltage drop warning)	Use O- or Y-type ring terminals (outer $\varnothing \leq 8.2$ mm, inner $\varnothing \geq M3.5$) and keep cable lengths short to minimize voltage drop.

Appearance



Dimensions



Unit : mm

Ordering Information

Model No.	Product Description
RPM-450	450W 9-32V to 13.8V Buck-Boost Voltage Regulator Module for DC Systems, -25°C ~ 70°C

Optional Accessories

DINRAIL-RPM-450	DIN Rail mount for RPM-450
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