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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, -40°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 Neousys 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 Neousys 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	
Input voltage	9V to 32V
Undervoltage shutdown	8.5V
Undervoltage recovery	8.9V, Automatic recovery
Overvoltage shutdown	34V
Overvoltage recovery	32.3V, Automatic recovery
Input current	Max. 50A, per pin 25A
No load current	156mA
Output Characteristics (Vin=13.8V; Iout=33A, RT=25°C)	
Efficiency	94%
Output voltage	13.8V
Output current	0 ~ 33A
Rated Power	450W
Over Current Protection	47A
Output ripple and noise	120mV
Output voltage rise time	3.38ms
Boot delay time	216ms
Voltage regulation	±1%
Load regulation	±1%

Protection	
UVP	OFF ≤ 8.5 V, ON ≥ 8.9 V; auto-recovery
OVP	OFF ≥ 34 V, ON ≤ 32.3 V; auto-recovery
OCP	Trips at 47 A; power-cycle to restore output
SCP	Survives 2 h short-circuit; power-cycle to restore output
RPP	Reverse-input protected up to 38 V without damage
Mechanical	
Dimension	95 mm (W) x 144.1 mm (D) x 41.2 mm (H)
Weight	0.8 kg
Mounting	Wall-mount (standard) DIN-rail mount (optional)
Positive/Negative electrode cable (input/output)	Use O- or Y-type rings; outer Ø ≤ 8.2 mm inner Ø ≥ M3.5 screw
Environmental and Safety	
EMC	CE/FCC Class A, according to EN 55032 & EN 55035
Operating Temperature	-25°C ~ 70°C
Storage Temperature	-40°C ~ 85°C
Humidity	5%~90% , non-condensing
Switching Frequency	350KHz

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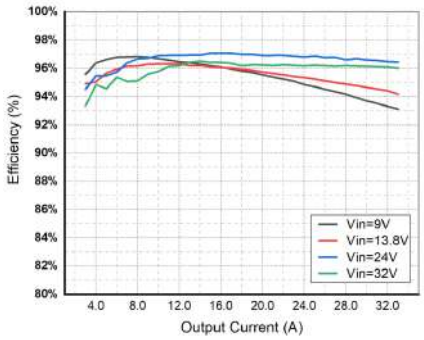
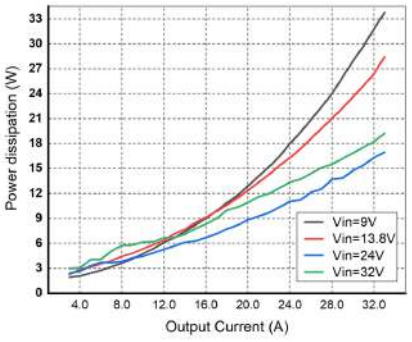
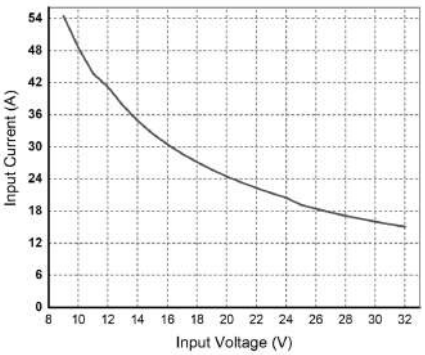
Characteristic Curves



Efficiency

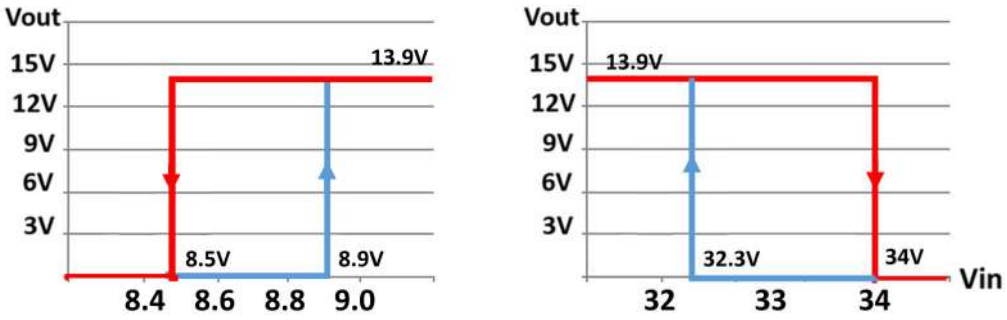


Power dissipation



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 (power foldback). 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.
MCU display related to DC_IN	An onboard microcontroller monitors DC_IN, DC_OUT, and protection states in real time. Front-panel LEDs provide intuitive indications—"DC IN OK," "UV/OV Alert," and "Stabilizer ON"—so technicians can verify system status at a glance.
Wiring Instructions (voltage drop warning)	Use O- or Y-type ring terminals (outer Ø ≤ 8.2 mm, inner Ø ≥ M3.5) and keep cable lengths short to minimize voltage drop.

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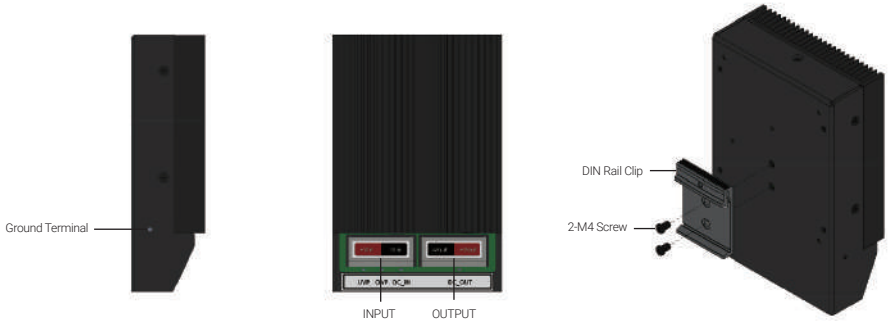
Appearance



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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