

12V DC battery backup system Micro UPS (uninterruptible power supply)

Quick Installation Guide

Version 1.0b

Introduction

The UPS-128 board is a small yet powerful UPS (uninterruptible power supply) solution. The UPS-128 board was conveniently design to be compatible with quarter brick PSU standard (58 x 36mm).

The UPS-128 board ensures uninterrupted power for your electronics by automatically switching in between a DC input source (12V /13-18V) and a battery). The switching in between the power sources is instantaneous, thus allowing smooth, uninterrupted device operation. The UPS-128 board also has a built-in, 1.2A fast charger unit. Because of its low V(in) charging capabilities, UPS-128 board has been optimized for vehicle use.

Mode of Operation

The UPS-128 board has been specifically designed for uninterruptible small/medium power PC operation, where “always on” operating is required. Applications for the picoUPS include a wide range of systems including servers and telecom and high availability systems or for powering electronics in vehicle applications. For example, the V(in) of UPS-128 board can be plugged into a vehicle cigarette lighter, while V(out) provides an uninterrupted power source selected from either cigarette lighter or the backup battery.

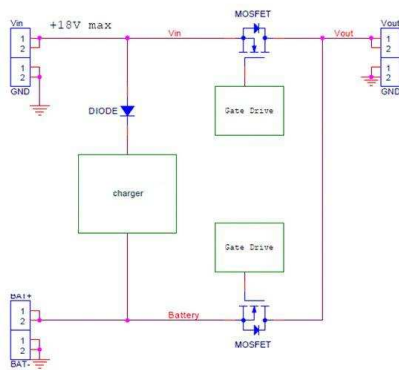


Fig 1.1 block diagram

Power inputs

1) A 13-18V power source. (13.5V – 16V ideal)

NOTE: Unit will work as low as 6V, but battery will not be charged if V(in) is lower than 13V!

2) A Lead Acid or Sealed Lead Acid battery (4Ah-60Ah)

Power Path Switching

The UPS-128 board will automatically switch in between V(In) and BAt depending on who has a higher voltage. The switching hysteresis is as low as 10mv. As a result, when AC/DC power is lost, the picoUPS will automatically switch to Battery output. The switching speed is about 100nS. When powered from main source, V(in) a green LED will light up indicating that the main power source path is ON.

Battery charging, bulk charging mode

The UPS-128 board has a built in, fast 1.2A, constant current, constant voltage, SLA battery charger. Depending on battery size and level of discharge, charging stage can be anywhere from few minutes to few hours. For example, a typical 7AH / 12V SLA battery will fully charge in 6 hours. When the battery is near full capacity, charge current will slowly decrease.

Typical configuration

A typical configuration for a low / medium power computer setup is comprised from a 12V / 7Ah battery, a 13.5V from a vehicle. The output can be coupled to power supply

Specifications, UPS-128 board .

Power Ratings (max load = 10A)

Volts (V)	Max Load (A)	Peak Load (A)	Max Charge Current
6-18V*	6A fanless / 10A fan	12A	1200mA**
<p>* if Vcc is below 13-13.5V unit will work but will not fully charge the Battery. ** Charge current can be modified by changing the current sense resistor , R22, R20:</p> <p>R(sense)=0.1R I(lim)= 600mA R(sense)=50mR I(lim)=1200mA (default) R(sense)=25mR I(lim)=2400mA</p> <p>Note: R(sense) it's noted R22 on the PCB</p> <p>Precautions for operating this DC-DC converter: -Inrush input current should not exceed 20A. -Peak load should not exceed 60 seconds. -Idle current: < 6mA. For standby periods exceeding 30 days, min. battery size should be 7Ah. -Float voltage is 13.5V (+/- 1%). Use only with SLA -Low voltage battery cut-off not provided by this module.</p>			

Input Requirements: 13-18V regulated, min=2A, max = load dependent.

Fuse: Blade, 10A

Size: 58mm(L) * 36mm(W) * 20mm (H) (1U compliant)

Weight: 20grams

Connectors: Faston Blades, 0.187"

Overload protection

This unit does not provide overload protection. Inrush current should not exceed more than 20A for 1 second.

Operating environment

Temperature: -20 to 65 degree centigrade.

NOTE: For fanless operation, please ensure that the PSU body temperature, T(psu) does not exceed 75C. Higher temperatures are allowed, but MTBF could decrease. Maximum power supply body temperature T(psu) is 85C.

Relative Humidity: 10 to 90 percent, non-condensing.

Efficiency, MTBF: 95%. MTBF=100K hours at T(psu) 55Celsius.

Shipping and storage

Temperature -40 to +40 degree centigrade. Relative humidity 5 to 90 percent, non-condensing