

1. Product Info / 产品信息

High-Efficiency QC3.0/QC2.0 DC-DC Buck Converter Fast Charging

Module 高效 QC3.0/QC2.0 直流降压快充模块

Product Description: This versatile DC-DC step-down module is designed to convert a wide range of input voltages (6V-32V) into high-speed USB charging ports. 这款多功能直流降压模块旨在将宽范围的输入电压（6V-32V）转换为高速 USB 充电端口。

Available in 1-port, 2-port, and 4-port configurations, it provides an ideal solution for automotive, solar, and DIY power projects. 提供单口、双口和四口配置，为汽车、太阳能和 DIY 电源项目提供理想的解决方案。

The module supports a vast array of fast-charging protocols including Qualcomm QC3.0, Huawei FCP/SCP, Samsung AFC, and MediaTek PE. 该模块支持多种快充协议，包括高通 QC3.0、华为 FCP/SCP、三星 AFC 和联发科 PE。

With a conversion efficiency of up to 97%, it ensures minimal heat generation while delivering up to 24W of power per port. 转换效率高达 97%，在每个端口提供高达 24W 功率的同时确保极低的发热量。

Integrated protection features such as overvoltage, undervoltage, and short-circuit protection guarantee the safety of your connected devices.

集成的过压、欠压和短路保护等多重保护功能，确保了所连接设备的安全性。

Technical Specifications:

Input Voltage: DC 6V - 32V. **输入电压:** 直流 6V - 32V。

Output Voltage: Default 5V; automatically adjusts between 3V-12V after fast charge triggering. **输出电压:** 默认 5V; 触发快充后在 3V-12V 之间自动调节。

Output Power: Maximum 24W per port (5V/3.4A, 9V/2.5A, 12V/2A).

输出功率: 每口最大 24W (5V/3.4A, 9V/2.5A, 12V/2A)。

Efficiency: 90% - 97%. **转换效率:** 90% - 97%。

Dimensions: 1-Port (38x15.6mm), 2-Port (40x50mm), 4-Port (45x90mm). **尺寸:** 单口 (38x15.6mm), 双口 (40x50mm), 四口 (45x90mm)。

2. Safety & Warnings / 安全警告

Polarity Requirement: Always ensure the input polarity is correct (IN+ to positive, IN- to negative) to avoid burning the circuit. **极性**

要求： 务必确保输入极性正确（IN+ 接正极，IN- 接负极），以防烧毁电路。

Voltage Range: Do not exceed the maximum input voltage of 32V to prevent permanent damage to the capacitors and IC. **电压范围：** 请勿超过 32V 的最大输入电压，以防止电容和集成电路发生永久性损坏。

Heat Dissipation: While highly efficient, the module may become warm during high-power charging; ensure adequate ventilation.

散热处理： 虽然效率很高，但在高功率充电期间模块可能会变热；请确保通风良好。

Load Limit: Do not attempt to draw more than the rated 24W per port to maintain stable operation and device longevity. **负载限制：** 请勿尝试超过每口额定 24W 的功率，以维持稳定运行和设备寿命。

3. Instructions for Use / 使用说明

1.Input Wiring: Solder or connect your DC power source to the IN+ and IN- pads on the PCB. **输入接线：** 将您的直流电源焊接或连接到 PCB 上的 IN+ 和 IN- 焊盘。

Power On: Apply an input voltage between 6V and 32V; the onboard LED indicator (if equipped) will light up. **通电：** 接入 6V 至 32V 之间的输入电压；板载 LED 指示灯（如果配备）将亮起。

Device Connection: Plug your mobile phone or tablet into the USB port using a high-quality charging cable. **设备连接：** 使用高质量充电线将手机或平板电脑插入 USB 端口。

Fast Charge Negotiation: The module will automatically communicate with the device to select the optimal fast-charging voltage. **快充握手：** 模块将自动与设备通信，以选择最佳的快充电压。

Installation: For automotive use, ensure the module is securely mounted and protected from moisture or direct sunlight. **安装指导：** 用于车载时，请确保模块安装牢固，并防止受潮或阳光直射。

4. MAINTENANCE & STORAGE / 维护与存储

Cleaning: Use a dry, soft brush to remove dust from the USB ports and components to ensure good contact. **清洁：** 使用干燥的软刷清除 USB 接口和组件上的灰尘，以确保良好的接触。

Storage: Store the module in an anti-static bag in a cool, dry place when not in use. **存储:** 不使用时, 请将模块存放在阴凉干燥处的防静电袋中。

5. DISPOSAL & RECYCLING / 丢弃与回收

E-Waste Management: This product contains electronic components and should not be discarded with regular household waste. **电子垃圾管理:** 本产品含有电子元件, 不应与普通生活垃圾一起丢弃。

Local Regulations: Please recycle the module through certified electronic waste collection points according to your local laws. **当地法规:** 请根据当地法律, 通过经认证的电子垃圾收集点对模块进行回收。