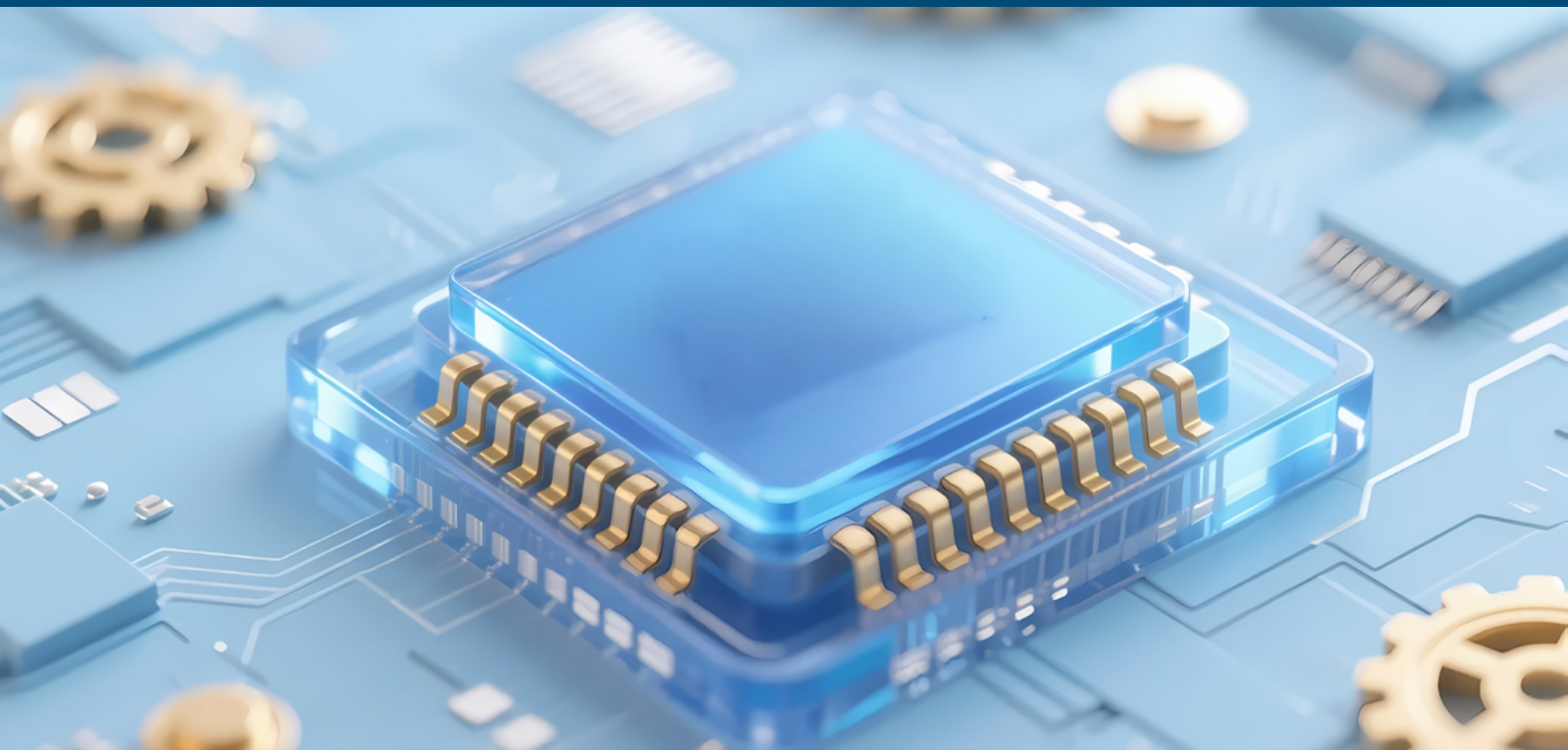
Analog IP – Boost Converter



About eInfochips

eInfochips is a product engineering and semiconductor design services company offering ASIC/SoC design, Analog & Mixed-Signal IP development, FPGA design, and embedded engineering services across multiple industry segments.

eInfochips provides silicon-proven Analog IPs and custom design solutions for power management, data conversion, connectivity, and mixed-signal applications. The company enables customers to accelerate chip development and deliver high-performance, power-efficient semiconductor products.

eInfochips A3ACPNBTC Boost Converter

DC-DC Boost Converter, also known as a step-up converter, is a type of power converter that increases (boosts) the input voltage to a desired higher level at the output. It is widely used in battery-powered and renewable energy applications where efficient voltage conversion and regulation are required.

Off-Grid & Solar Power System

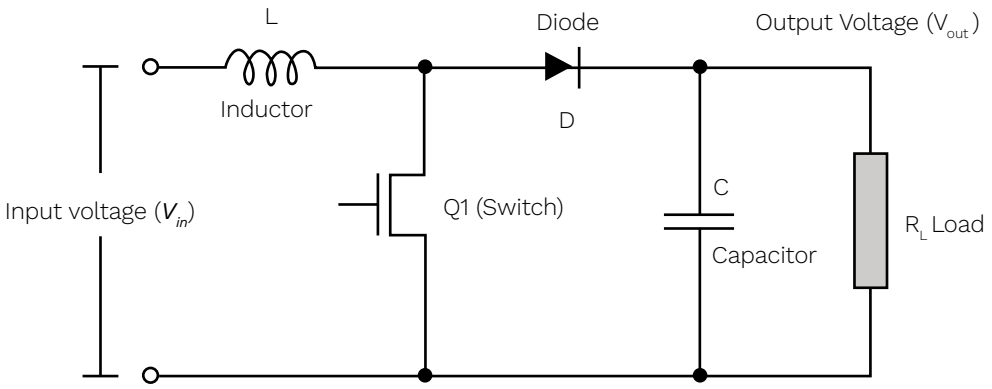
Electric Vehicles (EVs)

Telecommunications

LED Lighting

eInfochips Advantages

- **30** Years of experience in system design
- **17** Design centres worldwide
- **400+** Tapeouts
- **100M+** Product deployments across globe
- **180nm to 18A** expertise



Block Diagram

Features

- Up to 89% Efficiency in Typical Operating Conditions
- -40°C to +150°C
- Startup Into Load at 4V Input Voltage.
- Operating Input Voltage from 4 V to 32 V.
- Adjustable Output Voltage from Vin+15V.
- Output rail supplies the high-side gate driver, enabling VGS ≈ 14V (above source) for reliable enhancement of external N-channel MOSFET switches.

Over Temperature

Thermal Shutdown Protection

- Integrated thermal shutdown protection prevents device overheating.
- The LDO shuts down when the junction temperature exceeds 150°C (typ.).
- Normal operation resumes when the junction temperature falls below 130°C (typ.).
- Under persistent overload conditions, the device may cycle between shutdown and restart states.

Modes of Operation

- **Power MOSFET**
  Connected between VSW and GND, controlled by VGN
- **ON State**
  MOSFET ON, inductor stores energy
- **OFF State**
  MOSFET OFF, inductor transfers energy to the output, boosting the voltage

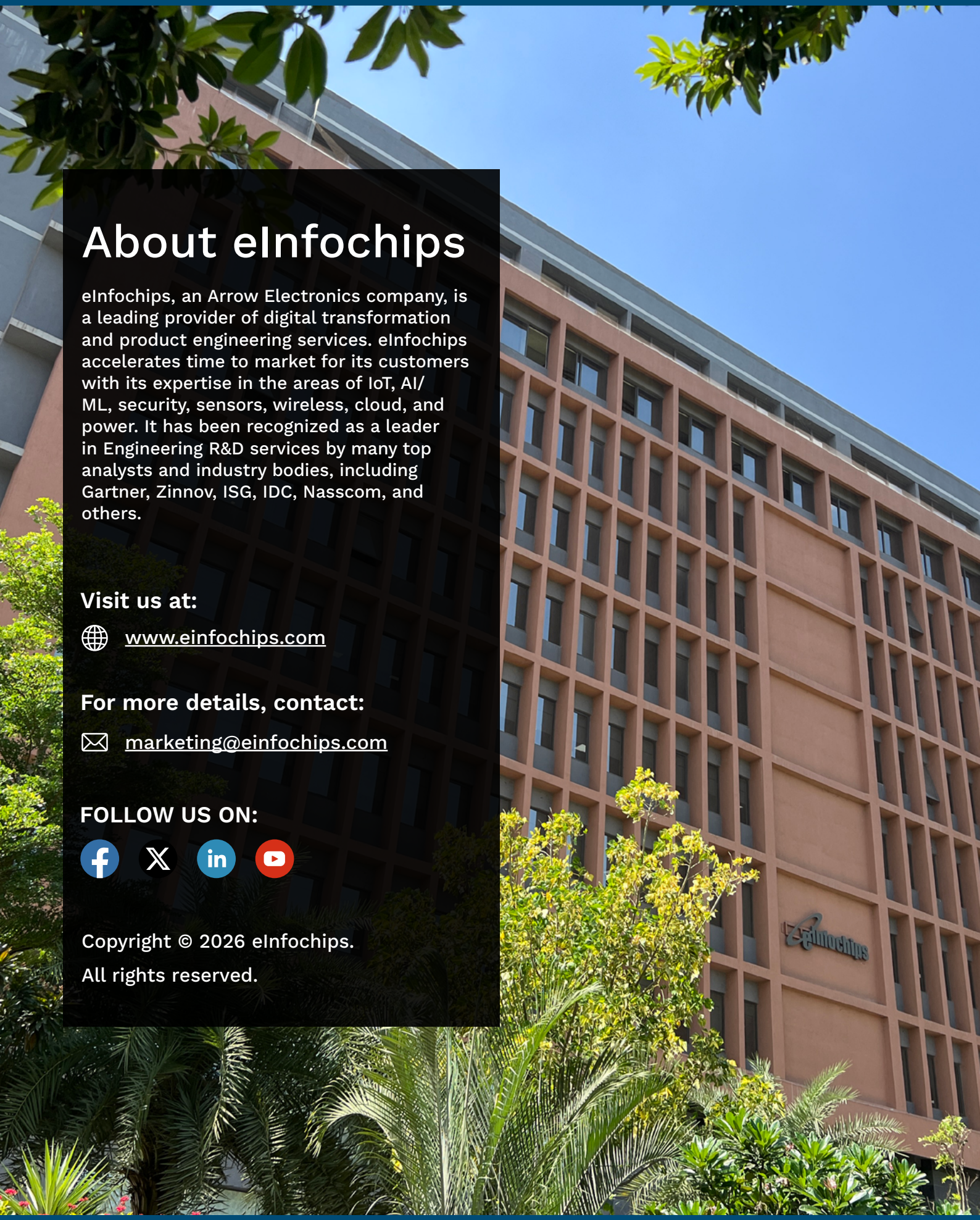
Absolute Maximum Ratings

- **Input voltage range:** 4V to 32V
- **Operating Junction Temperature Range:** -40 to +150 °C

Circuit Components and Design Considerations

The main components of the Boost Converter are:

- **Input Source (Vin):** DC input voltage, typically from a battery
- **Inductor (L):** Stores energy during the ON phase and releases it during the OFF phase
- **Power Switch (MOSFET):** Controlled by a PWM signal for switching operation
- **Diode (D):** Prevents reverse current flow and directs energy to the output
- **Capacitor (C):** Filters the output voltage to minimize ripples.
- **Load (R):** Represents the output circuit consuming the boosted voltage



About eInfochips

eInfochips, an Arrow Electronics company, is a leading provider of digital transformation and product engineering services. eInfochips accelerates time to market for its customers with its expertise in the areas of IoT, AI/ML, security, sensors, wireless, cloud, and power. It has been recognized as a leader in Engineering R&D services by many top analysts and industry bodies, including Gartner, Zinnov, ISG, IDC, Nasscom, and others.

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