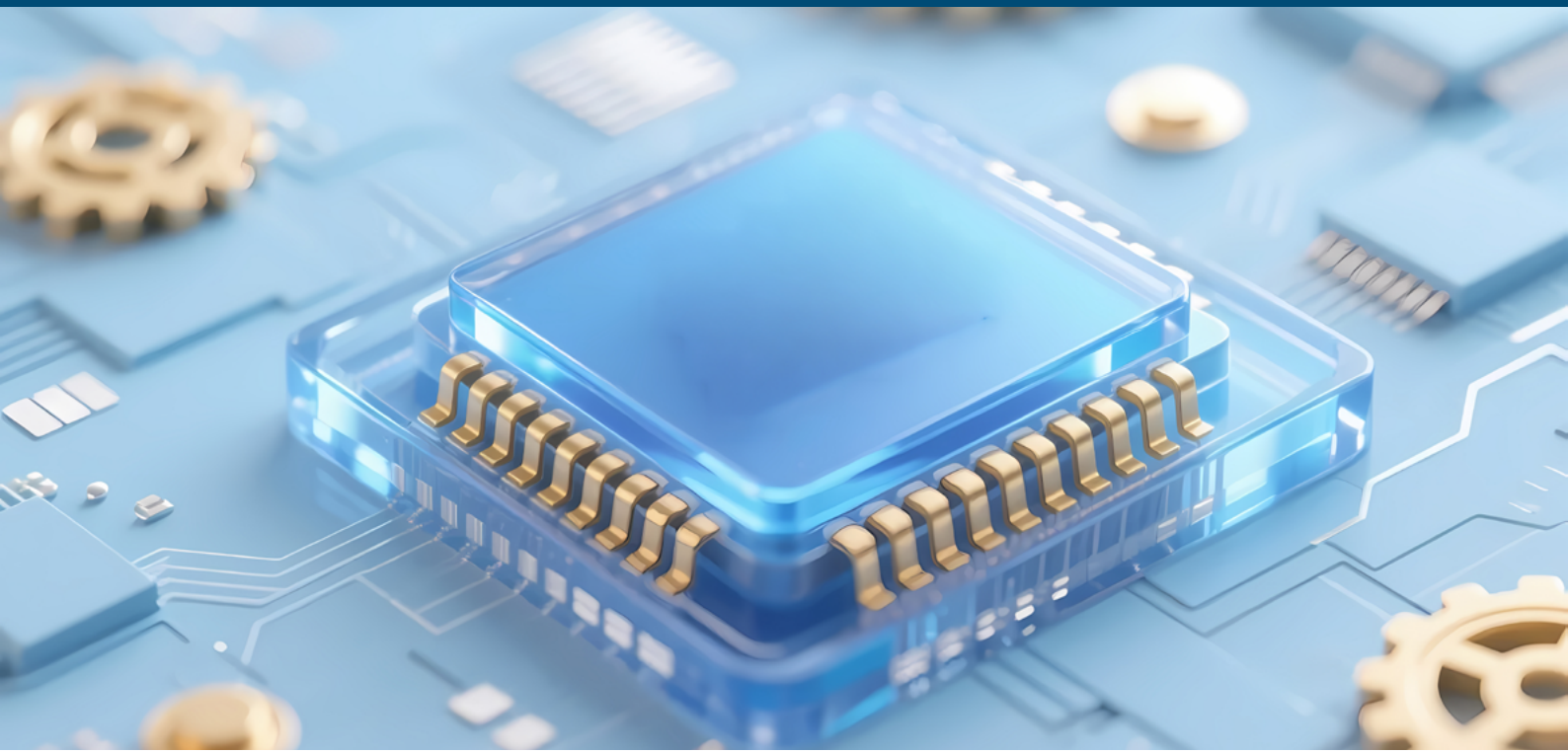
BANDGAP REFERENCE (BGR) with Calibration Circuit



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 Advantages

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

eInfochips Capacitive Charge Pump (CCP)

The capacitive charge pump provides a voltage-boosting stage for the low-side gate-driver supply. The charge pump boosts the available **5 V input supply to approximately 15.5 V**, providing sufficient headroom for the integrated **14 V LDO** to maintain the required regulated output.

The charge pump employs an external **1N4148 diode, 4.7 µF ceramic capacitor, and 100 kHz clock signal with 5 V amplitude** for charge transfer and voltage boosting. The architecture comprises cascaded diode-capacitor pumping stages followed by a peak-detector stage at the load. The detailed circuit implementation is shown in the corresponding circuit diagram.

Automotive LDO Regulators

Boost Converters

PMICs

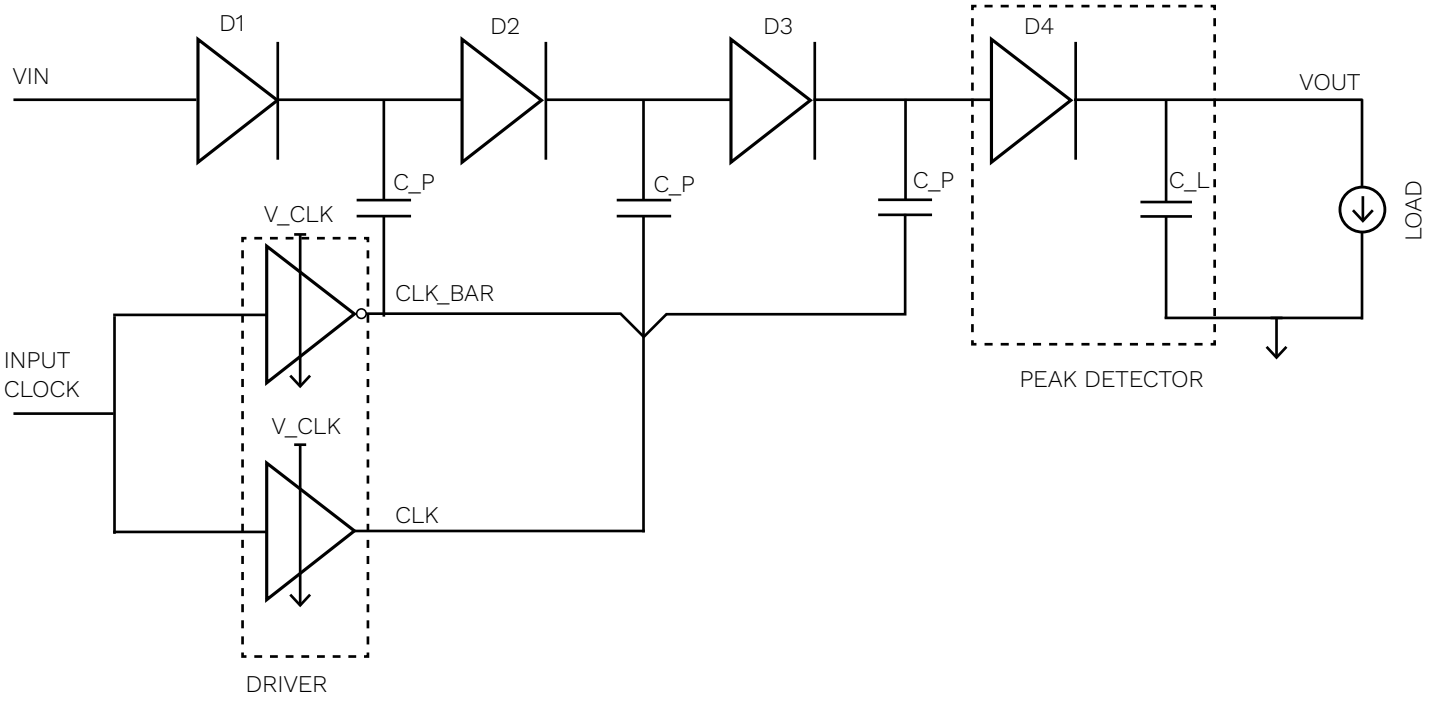
Battery Management Systems (BMS)

Analog Front-End Circuits

Sensor Interfaces

Data Converters (ADC/DAC)

High Voltage Automotive Analog ICs



Features

- 5 V& 0V input supply
- 15 V boosted output
- Driver Supply (External) 5V.
- 100 kHz clock operation
- 5 V clock amplitude
- Max. Load Current = 330mA (rise/fall time = 1us, Pulse width = 0.5us, period = 50us)
- Constant DC load current (3.2 mA)
- External 1N4148 diode support
- External diode and capacitors.

Charge Pump Operation:

Clock Driver

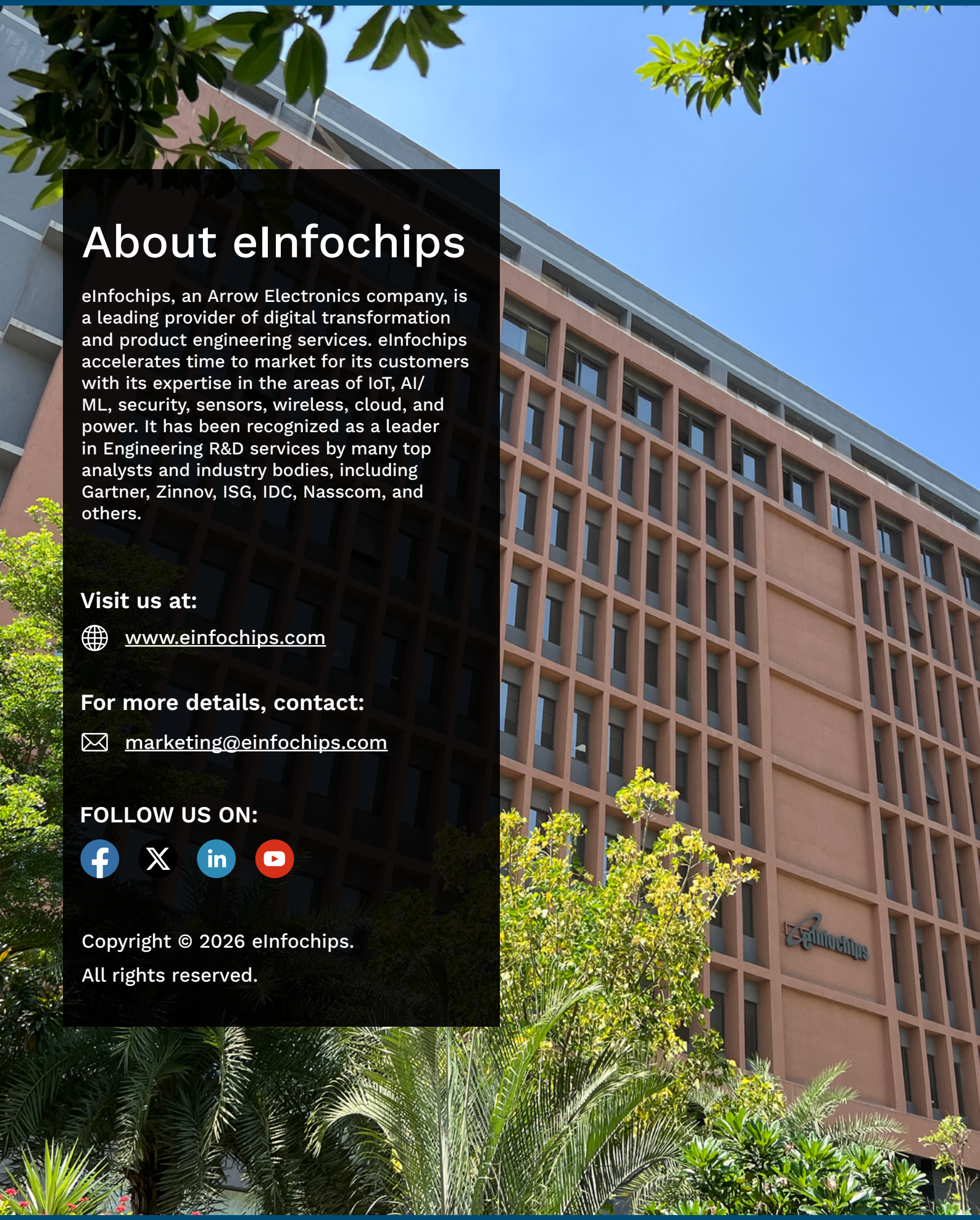
The driver block generates complementary clock signals (CLK and CLK_BAR) to drive the charge-pump stages. The clock signals provide the required voltage swing for efficient charge transfer through the pumping capacitors

First Charge Pump Stage

Diode D1 and pumping capacitor CE1 form the first charge-pump stage. The stage initiates charge transfer and voltage multiplication based on the applied clock phases

Second Charge Pump Stage

Diode D2 and pumping capacitor CP form the subsequent charge-pump stage. The stage provides additional voltage multiplication through successive charge transfer from the preceding stage



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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