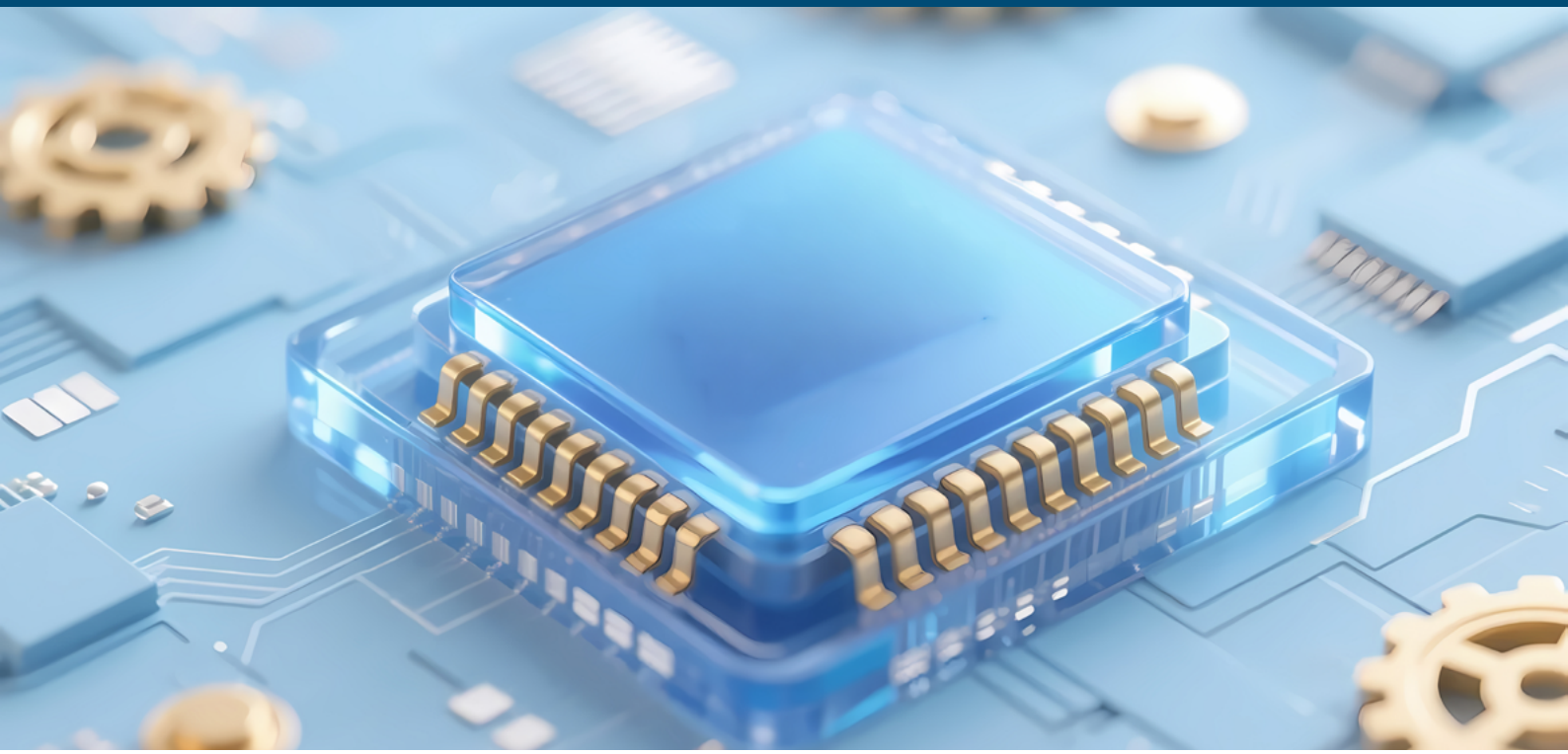
BANDGAP REFERENCE (BGR) with Calibration Circuit



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 A3ACPNBGR BANDGAP REFERENCE (BGR) with Calibration Circuit

The eInfochips A3ACPNBGR is a precision 1.2 V Bandgap Reference (BGR) with calibration circuitry designed for automotive analog and mixed-signal SoCs. The reference voltage is generated by combining a CTAT component derived from VBE and a PTAT component derived from ΔVBE, resulting in a temperature-stable output voltage. The BGR is intended for applications such as LDOs, ADCs, DACs, PMICs, comparators, and sensor interfaces.

CTAT Generation:

CTAT voltage is derived from the bipolar transistor VBE, which decreases with increasing temperature.

PTAT Generation:

PTAT voltage is derived from ΔVBE of bipolar devices operating at different current densities and increases with temperature.

Automotive LDO Regulators

Boost Converters

PMICs

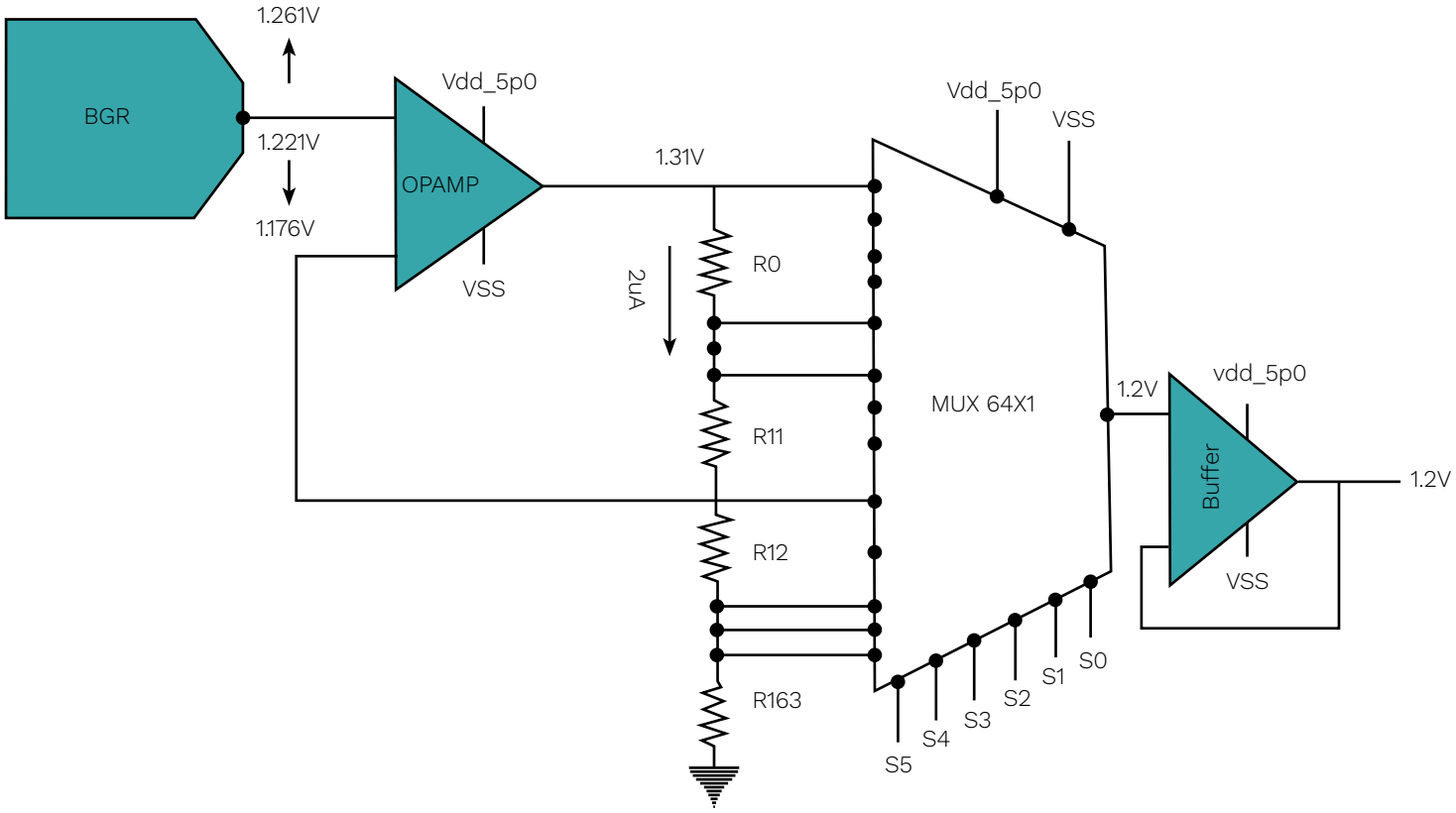
Battery Management Systems (BMS)

Analog Front-End Circuits

Sensor Interfaces

Data Converters (ADC/DAC)

High Voltage Automotive Analog ICs



Features

- AEC-Q100 Grade0 target
- -40°C to +150°C
- 1.2V reference
- Low drift
- High PSRR
- Low noise
- Trim support
- Buffered output option

Absolute Maximum Ratings

- **Supply Voltage:** -0.3 V to 6.5 V
- **Maximum Junction Temperature:** 175°C
- **HBM ESD Rating:** 2 kV

Recommended Operating Conditions

- **Supply Voltage (VDD):**
  2.7 V to 5.5 V (5.0 V typ.)
- **Operating Temperature Range:**
  -40°C to +150°C (25°C typ.)

Electrical Characteristics

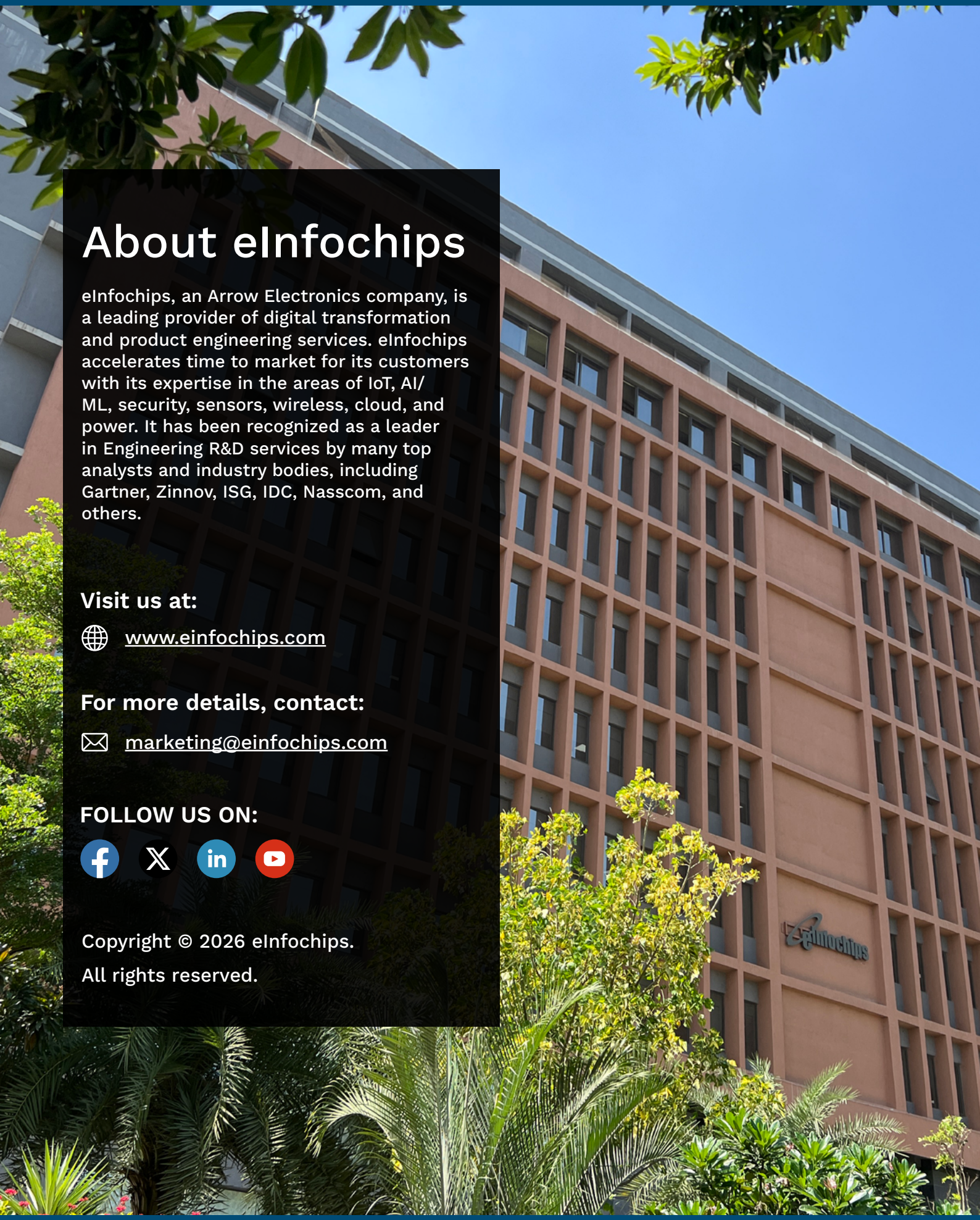
- **Reference Voltage (VREF):** 1.172 V to 1.264 V (1.221 V typ.)
- **Temperature Drift:** 9.35 ppm/°C (typ.)
- **Supply Current (IQ):** 12 µA to 34 µA (21 µA typ.)

PVT Results

- **Functionality verified** across TT, FF, SS, FS, and SF process corners
- All PVT simulations passed successfully

Monte Carlo Summary

- **1000 Monte Carlo runs** completed successfully.
- **Mean VREF:** 1.22 V
- **3σ Variation:** 69 mV
- **Yield:** 100%



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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